

Table B.3 - Vegetation Percent Cover Matrix for the WSA

[illegible]

Table B.3 - Vegetation Percent Cover Matrix for the WSA

[illegible]

Table B.3 - Vegetation Percent Cover Matrix for the WSA

Forest Group (FG)		Spruce Hemlock Forest (SH)											Spruce Pine Forest (SP)											Tolerant Hardwood Forest (TH)			Wet Coniferous Forest (WC)						Wet Deciduous Forest (WD)	Wet Mixedwood Forest (WM)													
Vegetation Type (VT)		SH4	SH4	SH4	SH4	SH4	SH5	SH5	SH5	SH5b	SH5b	SH8	SP1a	SP4a	SP4a	SP4a	SP5	SP5	1	SP7	SP7	SP7	SP7	TH6	TH8	TH8a	WC11	WC11	WC2	WC7	WC7	WC7	WD2	WM1	WM1	WM1	WM1	WM1	WM1	WM1	WM1	WM2	WM3	WM3	WM3		
Vegetation Type	Species Name	AK15	AK30	AK31b	AK36	AK78	AK1	AK29	AK91	AK37	AK49	AK7	AK100	AK51	AK82	AK90	AK20	AK54	AK42	AK43	AK53	AK89	AK103	AK97	AK94	AK19	AK81	AK84	AK23	AK25	AK62	AK101	AK12	AK8	AK35	AK46	AK58	AK76	AK79	AK80	AK68	AK28	AK73	AK77			
Tree	Abies balsamea	0	0	0	0	0	0	2	0	25	30	30	0	0	0	0	0	0	0	0	0	0	0	0	3	5	0	0	5	0.5	10	0	0	1	30	10	15	20	10	10	5	5	5	0	0	0	
	Acer pensylvanicum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Acer pseudoplatanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Acer rubrum	2	1	0	0	5	5	0	0	10	15	5	5	0	5	0.5	0	0	1	0	0	0.5	10	15	30	25	1	0	5	1	20	10	30	10	15	40	40	30	30	15	50	10	30	30	0	0	
	Betula alleghaniensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	25	5	0	0	0	0	0	35	20	2	0	0	0	0	0	0	20	0	0	0		
	Betula papyrifera	3	1	0	0	0	3	0	0	10	0	10	0	0	0	0	0	0	0	1	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
	Betula populifolia	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0			
	Frangula alnus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	Fraxinus americana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	1	5	0	10	0	0	0	0	0	0	0	0	0	
	Larix laricina	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	10	0	0	2	0	20	0	0	0	5	15	0	10	30	20	0	0	0	1	0	0	15	1	0	0	10	10	0	
	Picea glauca	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	10	0	0	1	0	0	0	0	0	0	0	0	0	
	Picea mariana	0	0	0	0	0	0	0	0	0	0	0	0	40	15	25	40	20	60	20	30	60	30	20	0	0	0	20	35	40	8	0	15	0	0	0	1	0	0	2	0	0	30	15	25	0	
	Picea rubens	50	40	15	50	10	60	30	10	15	25	15	0	0	0	0	0	0	0	0	0	0	0	0	5	2	10	0	0	0	0	0	0	10	0	0	10	0	0	0	0	15	0	0	0	0	
	Pinus strobus	15	15	8	10	30	0	1	0	0	0	0	0	10	5	10	20	2	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	
	Populus grandidentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Populus tremuloides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Prunus pensylvanica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Prunus serotina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Quercus rubra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sorbus americana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Shrub	Abies balsamea	0	0	0	0	0	0	0	10	20	10	10	0	0	0	0	0	0	0	0	0	0	0	5	30	15	1	0	0	5	30	2	20	1	10	0	20	10	5	0	8	1	0	5	0	
		Acer pensylvanicum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Acer pseudoplatanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Acer rubrum	0	0	8	4	0	0	0	5	0	0	0	0	5	1	0	4	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	10	0	0	0	0	0	0	0		
		Acer spicatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0		
		Alnus incana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	15	0	2	0	0	5	0	0	0	5	0	0	0		
Alnus alnobetula		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Amelanchier sp.		0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Betula alleghaniensis		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	2	5	0	0	0	0	0	0	4	1	0	0		
Betula papyrifera		0	5	2	10	0	0	0	2	0	0	0	0	0	0.5	1	0	7	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	
Betula populifolia		0	0	0	1	0	0	0	0	0	0	0	0	10	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
Chamaedaphne calyculata		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Comptonia peregrina		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Corylu cornuta		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Diervilla lonicera		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Fagus grandifolia		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Frangula alnus		0	0	0	12	0	0	0	2	0	5	0	0	0	0	0	0	0	0.5	0	0	0.5	0	15	0	0	5	1	0	10	4	20	20	5	2	50	5	25	30	20	10	20	40	10	0	0	
Fraxinus americana		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	15	0	0	0	0	0	0	0	2	0	0	0		
Gaylussacia baccata		0	1	0	0	0	5	0	0	0	0	0	0	2	0	0	10	0	0	0	0	12	0	0	0	0	0	40	0	0	3	0	0	0	0	0	0	0	1	10	0	0	0	0	0	0	
Hamamelis virginiana		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Ilex mucronata		2	8	0	0	15	2	20	0	0	0	0	0	5	5	5	5	0	1	5	10	20	15	0	0	0	0	20	0	2	5	0	5	0	0												

Table B.3 - Vegetation Percent Cover Matrix for the WSA

[illegible]

Table B.3 - Vegetation Percent
Cover Matrix for the WSA

Forest Group (FG)		Wetland														
Vegetation Type (VT)		swamp	swamp	swamp	swamp	swamp	swamp	swamp	TSS	TSS	TSS	TSS	TSS	fen	fen	marsh
Vegetation Type	Species Name	AK32	AK44	AK48	AK55	AK56	AK67	AK70	AK3	AK4	AK5	AK14	AK22	AK24	AK47	AK13
Tree	Abies balsamea	5	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0
	Acer pensylvanicum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Acer pseudoplatanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Acer rubrum	5	1	5	20	20	1	0.5	0	0	0	0	0	1	0	0
	Betula alleghaniensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Betula papyrifera	0	0	0	0	0	0	0	2	0	1	0.5	0	0	0	0
	Betula populifolia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Frangula alnus	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0
	Fraxinus americana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Larix laricina	2	0	10	0	0	1	0.5	1	0	0	0	0	0	0	0
	Picea glauca	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
	Picea mariana	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
	Picea rubens	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
	Pinus strobus	0	0	0	0.5	0	0	0	0	0	0	0	1	0	0	0
	Populus grandidentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Populus tremuloides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Prunus pensylvanica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Prunus serotina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Quercus rubra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sorbus americana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shrub	Abies balsamea	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	Acer pensylvanicum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Acer pseudoplatanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Acer rubrum	0	0	0	10	5	10	0	0	0	0	0	2	0.5	0	0
	Acer spicatum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Alnus incana	0	0	20	0	0	0	20	40	0	0	30	30	0	7	10
	Alnus alnobetula	0	0	0	0	0	0	0	0	25	80	0	0	0	0	0
	Amelanchier sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Betula alleghaniensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Betula papyrifera	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Betula populifolia	5	0	0	0	0	30	0	0	0	0	0	0	0	0	0
	Chamaedaphne calyculata	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0
	Comptonia peregrina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Corylu cornuta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diervilla lonicera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fagus grandifolia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Frangula alnus	40	2	2	20	60	35	30	60	25	1	45	40	1	0	5
	Fraxinus americana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gaylussacia baccata	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hamamelis virginiana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ilex mucronata	2	10	0	0	0	0	10	0	0	0	0	0	0	0	0
	Ilex verticillata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Juniperus communis	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Kalmia angustifolia	25	10	0	2	0	10	0	0	0	0	0	0	0	0	0
	Larix laricina	0	0	30	8	0	0	0	0	0	0	0	0	1	2	0
	Lonicera canadensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Myrica gale	0	0	0	0	0	0	0	0	0	0	0	0	0	5	15
	Myrica pensylvanica	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	Picea glauca	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Picea mariana	15	5	1	1	5	0	0	0	0	0	0	10	0	0	0
	Picea rubens	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	Pinus strobus	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Populus grandidentata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Prunus pensylvanica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Quercus rubra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rhododendron canadense	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rhododendron groenlandica	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rosa multiflora	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	Rosa nitida	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
	Salix sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sambucus racemosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sorbus americana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Spiraea alba	0	0	5	0	0	0	0	0	0	0	1	5	0	0	5
	Spiraea tomentosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	Taxus canadensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Viburnum lantanoides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Viburnum nudum	5	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0
Ground Vegetation	Anthoxanthum spp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Athyrium filix-femina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Aralia nudicaulis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Agrostis capillaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Agrostis hyemalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	Agrostis perennans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Bazzania trilobata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Brachelytrum aristosum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Calamagrotis canadensis	0	0	0	40	10	0	0	0	0	0	0	0	0	50	0
	Carex echinata	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.5
	Carex gracillima	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Carex leptalea	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	Carex novae-angliae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Carex sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Carex stricta	0	0	60	30	5	0	0	0	0	0	0	0	0	20	0
	Carex triperma	1	0	0	2	0	0	10	0	0	0	0	0	0	0	0
	Centaurea nigra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Chelone glabra	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0
	Cicuta maculata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cladonia sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table B.3 - Vegetation Percent
Cover Matrix for the WSA

Forest Group (FG)		Wetland														
Vegetation Type (VT)		swamp	swamp	swamp	swamp	swamp	swamp	swamp	TSS	TSS	TSS	TSS	TSS	fen	fen	marsh
Vegetation Type	Species Name	AK32	AK44	AK48	AK55	AK56	AK67	AK70	AK3	AK4	AK5	AK14	AK22	AK24	AK47	AK13
Ground Vegetation (continued)	Clintonia borealis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Coptis trifolia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cornus canadensis	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cypripedium acaule	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Danthonia spicata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dennstaedtia punctilobula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Deschampsia flexuosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dicranium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Diervilla lonicera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Doellingeria umbellata	0	0	0	0	2	0	0	10	5	2	15	0	0	0	1
	Dryopteris carthusiana	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
	Dryopteris intermedia	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0
	Epigaea repens	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0
	Eriophorum virginicum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Euthamia graminifolia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Festuca rubra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fragaria virginiana	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0
	Frangula alnus	0	0	0	0	70	0	15	0	0	0	80	0	0	0	0
	Galium palustre	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	Galium sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gaultheria hispida	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gaultheria procumbens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Glyceria canadensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
	Glyceria grandis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Glyceria striata	0	0	5	0	0	0	0	5	0	0	0	0	0	0	0
	Iris versicolor	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0
	Hylocomium splendens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hypnum imopense	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
	Juncus canadensis	0	0	0	0	0	0	0	0	0	0	0	0	0	5	70
	Juncus sp.	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0
	Leontodon autumnalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lysimachia terrestris	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
	Maianthemum canadense	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Maianthemum trifoliata	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
	Mitchella repens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Moss sp.	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0
	Monotropa uniflora	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oclemena acuminata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oclemena x blakei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Onoclea sensibilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oryzopsis asperifolia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Osmunda cinnamomea	30	0	0	0	0	10	0	0	0	0	0	25	0	0	0
	Osmunda claytoniana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Osmunda regalis	0	0	0	0	0	0	0	0	0	0	0	0	70	0	0
	Oxalis montana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Phleum pratense	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Platanthera aquilonis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phegopteris connectilis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pilosella caespitosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pleurozium schreberi	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	
Poa compressa	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	
Pogonia ophioglossoides	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	
Polytrichum sp.	0	0	0	0	0	0	0	5	0	0	20	0	0	0	0	
Pontederia cordata	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	
Potentilla simplex	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	
Prunella vulgaris	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	
Pteridium aquilinum	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	
Ranunculus repens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rhynchospora alba	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	
Rhytidadelphus triquetrus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rubus canadensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rubus hispida	0	0	10	0	0	2	0	0	0	0	0	0	0	0	0	
Solidago canadensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Solidago puberula	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Solidago rugosa	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
Solidago uliginosa	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	
Sphagnum sp.	80	0	40	10	80	0	70	2	0	0	40	60	90	0	90	
Symphotrichum lateriflorum	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
Thalictrum pubescens	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	
Thelypteris noveboracensis	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	
Ground Vegetation (continued)	Trientalis borealis	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0
	Vaccinium angustifolium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Vaccinium myrtilloides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Veronica officinalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Viola sp.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Vicia cracca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX C

Wildlife Observations

Table C.1 Incidental Wildlife Observations Recorded During Field Programs

Scientific Name	Common Name	SARA ¹	COSEWIC ²	NS ESA ³	AC CDC ⁴
Birds					
<i>Empidonax alnorum</i>	Alder Flycatcher	-	-	-	S5B
<i>Corvus brachyrhynchos</i>	American Crow	-	-	-	S5
<i>Spinus tristis</i>	American Goldfinch	-	-	-	S5
<i>Setophaga ruticilla</i>	American Redstart	-	-	-	S5B
<i>Turdus migratorius</i>	American Robin	-	-	-	S5B, S3N
<i>Scolopax minor</i>	American Woodcock	-	-	-	S5B
<i>Haliaeetus leucocephalus</i>	Bald Eagle	-	NAR	-	S5
<i>Mniotilta varia</i>	Black-and-White Warbler	-	-	-	S5B
<i>Poecile atricapillus</i>	Black-capped Chickadee	-	-	-	S5
<i>Setophaga virens</i>	Black-throated Green Warbler	-	-	-	S5B
<i>Cyanocitta cristata</i>	Blue Jay	-	-	-	S5
<i>Vireo solitarius</i>	Blue-headed Vireo	-	-	-	S5B
<i>Buteo platypterus</i>	Broad-winged Hawk	-	-	-	S5B
<i>Cardellina canadensis</i>	Canada Warbler	TH	SC	EN	S3B
<i>Bombycilla cedrorum</i>	Cedar Waxwing	-	-	-	S5B
<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	-	-	-	S5B
<i>Quiscalus quiscula</i>	Common Grackle	-	-	-	S5B
<i>Chordeiles minor</i>	Common Nighthawk	SC	SC	TH	S3B
<i>Corvus corax</i>	Common Raven	-	-	-	S5
<i>Geothlypis trichas</i>	Common Yellowthroat	-	-	-	S5B
<i>Junco hyemalis</i>	Dark-eyed Junco	-	-	-	S4S5
<i>Dryobates pubescens</i>	Downy Woodpecker	-	-	-	S5
<i>Regulus satrapa</i>	Golden-crowned Kinglet	-	-	-	S5
<i>Dumetella carolinensis</i>	Grey Catbird	-	-	-	S4B
<i>Dryobates villosus</i>	Hairy Woodpecker	-	-	-	S5
<i>Catharus guttatus</i>	Hermit Thrush	-	-	-	S5B
<i>Setophaga magnolia</i>	Magnolia Warbler	-	-	-	S5B
<i>Geothlypis philadelphia</i>	Mourning Dove	-	-	-	S4B, S5M
<i>Leiothlypis ruficapilla ridgwayi</i>	Nashville Warbler	-	-	-	SNA
<i>Cardinalis cardinalis</i>	Northern Cardinal	-	-	-	S4
<i>Colaptes auratus</i>	Northern Flicker	-	-	-	S5B
<i>Setophaga americana</i>	Northern Parula	-	-	-	S5B

Table C.1 Incidental Wildlife Observations Recorded During Field Programs

Scientific Name	Common Name	SARA ¹	COSEWIC ²	NS ESA ³	AC CDC ⁴
<i>Pandion haliaetus</i>	Osprey	-	-	-	S4S5B,S5M
<i>Seiurus aurocapilla</i>	Ovenbird	-	-	-	S5B
<i>Setophaga palmarum</i>	Palm Warbler	--	-	-	S5B
<i>Dryocopus pileatus</i>	Pileated Woodpecker	-	-	-	S5
<i>Setophaga pinus</i>	Pine Warbler	-	-	-	S2S3B,S4S5M
<i>Haemorhous purpureus</i>	Purple Finch	-	-	-	S4S5B,S3S4N, S5M
<i>Loxia curvirostra</i>	Red Crossbill	-	-	-	S3S4
<i>Sitta canadensis</i>	Red-breasted nuthatch	-	-	-	S4S5
<i>Vireo olivaceus</i>	Red-eyed Vireo	-	-	-	S5B
<i>Phasianus colchicus</i>	Ring-necked Pheasant	-	-	-	SNA
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	-	-	-	S3B
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	-	-	-	S5B
<i>Bonasa umbellus</i>	Ruffed Grouse	-	-	-	S5
<i>Melospiza melodia</i>	Song Sparrow	-	-	-	S5B
<i>Melospiza georgiana</i>	Swamp Sparrow	-	-	-	S5B
<i>Zonotrichia albicollis</i>	White-throated Sparrow	-	-	-	S4S5B,S5M
<i>Loxia leucoptera</i>	White-winged Crossbill	-	-	-	S4S5
<i>Setophaga petechia</i>	Yellow Warbler	-	-	-	S5B
Mammals					
<i>Castor canadensis</i>	North American Beaver	-	-	-	S5
<i>Ursus americanus</i>	American Black Bear	-	NAR	-	S5
<i>Ondatra zibethicus</i>	Common Muskrat	-	-	-	S5
<i>Tamias striatus</i>	Eastern Chipmunk	-	-	-	S5
<i>Canis latrans</i>	Eastern Coyote	-	-	-	S5
<i>Erethizon dorsata</i>	North American Porcupine	-	-	-	S5
<i>Procyon lotor</i>	Northern Raccoon	-	-	-	S5
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	-	-	-	S5
<i>Odocoileus virginianus</i>	White-tailed Deer	-	-	-	S5
Amphibians					
<i>Lithobates clamitans</i>	Green Frog	-	-	-	S5
<i>Lithobates palustris</i>	Pickrel Frog	-	-	-	S5
<i>Ambystoma maculatum</i>	Spotted Salamander	-	-	-	S5
<i>Lithobates sylvaticus</i>	Wood Frog	-	-	-	S5

Table C.1 Incidental Wildlife Observations Recorded During Field Programs

Scientific Name	Common Name	SARA ¹	COSEWIC ²	NS ESA ³	AC CDC ⁴
Reptiles					
<i>Opheodrys vernalis</i>	Smooth Greensnake	-	-	-	S4
Notes: ¹ Species at risk in Canada listed under Schedule 1 the federal <i>Species at Risk Act</i> as Endangered (EN), Threatened (TH), or Special Concern (SC) (Government of Canada 2023). ² Species of conservation concern in Canada assessed by COSEWIC as Endangered (EN), Threatened (TH), Vulnerable (VU), or Special Concern (SC); not at risk species = NAR, Data Deficient = DD (Government of Canada 2023). ³ Species at risk in Nova Scotia listed under the provincial <i>Endangered Species Act</i> (NS) as Endangered (EN), Threatened (TH), Vulnerable (VU), or Special Concern (SC; Government of Nova Scotia 2023). ⁴ Species ranked as Critically Imperiled (S1), Imperiled (S2), or Vulnerable (S3) by the Atlantic Canada Conservation Data Centre (AC CDC 2023) and recorded within 5 km of the Project by desktop data source, where: S1: Critically Imperiled – Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences). May be especially vulnerable to extirpation. S2: Imperiled – Imperiled in the province because of rarity due to very restricted range, very few populations (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors. S3: Vulnerable – Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer). S4: Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors (80+ occurrences). S5: Secure – Common, widespread, and abundant in the province. S#S#: A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. SH: Possibly Extirpated (Historical) – Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences. SU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.					

APPENDIX D

ARIA Report



**HRM Serviced Communities
Background Study: Westphal
(Akoma Lands) Archaeological
Resource Impact Assessment,
Halifax Regional Municipality, NS
(2023)**

HRP #A2023NS190

Final Report

April 9, 2024

Submitted to:
Nova Scotia Department of
Communities, Culture, Tourism &
Heritage
1741 Brunswick Street 3rd Floor
PO Box 456, STN Central
Halifax, NS B3J 2R5

Prepared for:
Halifax Regional Municipality
5251 Duke Street, 3rd floor, Suite 300,
Duke Tower
Halifax, NS B3J 1P3

Prepared by:
Stantec Consulting Ltd.
102-40 Highfield Park Drive
Dartmouth, NS B3A 0A3

File: 160410459

**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

This document entitled HRM Serviced Communities Background Study: Westphal (Akoma Lands) Archaeological Resource Impact Assessment, Halifax Regional Municipality, Nova Scotia (2023) was prepared by Stantec Consulting Ltd. ("Stantec") for the account of Halifax Regional Municipality (HRM), (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Kyte,
Jonathan

Digitally signed
by Kyte, Jonathan
Date: 2024.08.13
08:40:29 -03'00'

Prepared by _____
(signature)

Jonathan Kyte, M.A., Archaeologist

McFarlane,
Shawn

Digitally signed by
McFarlane, Shawn
Date: 2024.08.13
10:55:37 -03'00'

Review by _____
(signature)

Shawn McFarlane, B.ScF, RPF, Project Manager



Table of Contents

PROJECT PERSONNEL	VI
1.0 INTRODUCTION	1
2.0 PROJECT DEVELOPMENT AREA	1
3.0 METHODOLOGY	2
3.1 BACKGROUND RESEARCH	2
3.2 ARCHAEOLOGICAL WALKOVER	2
4.0 BACKGROUND RESEARCH RESULTS	3
4.1 THE NATURAL ENVIRONMENT	3
4.2 CULTURAL AND HISTORICAL BACKGROUND	4
4.2.1 PRE-CONTACT PERIOD.....	4
4.2.2 HISTORIC PERIOD	5
4.2.3 REGISTERED ARCHAEOLOGICAL SITES NEAR THE PDA.....	8
4.2.4 PREVIOUS ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENTS	9
5.0 FIELD SURVEY RESULTS	9
5.1 WATERCOURSES.....	9
5.1.1 Smelt Brook: East & West Branch.....	10
5.1.2 Smelt Brook: Confluence and Lower End.....	11
5.1.3 Small Section of the West Branch of the Little Salmon River.....	12
5.2 HISTORIC AND MODERN FEATURES	12
5.2.1 Quarry and Associated Features.....	12
5.2.2 Historic Roads and Other Settlement Features within the PDA	12
6.0 SUMMARY AND RECOMMENDATIONS	14
7.0 CLOSING	15
8.0 REFERENCES	15

LIST OF FIGURES

Figure 1	Project Development Area: Westphal (Akoma Lands).....	Appendix A
Figure 2	Archaeological Assessment Notes and Heritage Features.....	Appendix A
Figure 3	Archaeological Potential Areas	Appendix A
Figure 4	Archeological Survey Tracklog.....	Appendix A
Figure 5	1800 Crown Records Displaced Plan	Appendix A
Figure 6	1813 Chamberlin Map	Appendix A
Figure 7	1865 Church Map	Appendix A
Figure 8	1908 Faribault Map (Sheet Nos. 68 and 53).....	Appendix A
Figure 9	1945 Aerial Photo	Appendix A



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

Figure 10	1954 Aerial Photo	Appendix A
Figure 11	1964 Aerial Photo	Appendix A
Figure 12	Akoma Holdings Survey Plan of Lot HCC1R-1	Appendix A
Figure 13	Dwelings Depicted on 1865 Church Map	Appendix A

LIST OF PHOTOGRAPHS

Photo 1	View facing south of the West Branch Smelt Brook at JRK-ARCH-180	Appendix B
Photo 2	View north showing an old trail encountered along the West Branch Smelt Brook at JRK-ARCH-181	Appendix B
Photo 3	View north showing the rocky surface conditions and past forest harvesting within the area at JRK-ARCH-182	Appendix B
Photo 4	View north of the East Branch Smelt Brook where the area becomes a wetland environment at JRK-ARCH-183	Appendix B
Photo 5	View northwest of a modern deer stand encountered at JRK-ARCH-184	Appendix B
Photo 6	View west from assessment note JRK-ARCH-185 where Smelt Brook opened into a larger wetland environment	Appendix B
Photo 7	View east from JRK-ARCH-185 towards the Old Lawrencetown Road at JRK-ARCH-185	Appendix B
Photo 8	View south showing the undulating surface conditions	Appendix B
Photo 9	View south from the east side of the east branch of Smelt Brook at JRK-ARCH-193	Appendix B
Photo 10	View north from the end of Boom Lake at the beginning of the eastern branch of Smelt Brook at MPR-ARCH-240	Appendix B
Photo 11	View south and looking down the east branch of Smelt Brook at MPR-ARCH-240	Appendix B
Photo 12	View north from CKM-ARCH-164 showing conditions encountered along east branch of Smelt Brook in the northern section	Appendix B
Photo 13	View east of an old bridge footing encountered along the northern section of the east branch of Smelt Brook at MPR-ARCH-241	Appendix B
Photo 14	View south at MPR-ARCH-242 showing downed trees and forest debris	Appendix B
Photo 15	View west of a modern drainage feature installed to direct the flow of the northern end of the watercourse away from nearby houses at MPR-ARCH-227	Appendix B
Photo 16	View east at the northern end of the west branch of the Smelt Brook at MPR-ARCH-227	Appendix B
Photo 17	View north from assessment note MPR-ARCH-228 showing conditions encountered on West Branch Smelt Brook	Appendix B
Photo 18	View east from MPR-ARCH-228 showing the slope encountered on west side West Branch Smelt Brook	Appendix B



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

Photo 19	View north of the old trail that leads to the old fields to the south at JRK-ARCH-188 Appendix B
Photo 20	View south of the West Branch Smelt Brook and trail encountered at JRK-ARCH-185 at the end of an old field Appendix B
Photo 21	View northwest at the identified medium potential area MPR-POLY-016 taken from MPR-ARCH-231 Appendix B
Photo 22	View west showing the identified medium potential area MPR-POLY-016 taken from MPR-ARCH-231 Appendix B
Photo 23	View southeast showing the identified medium potential area MPR-POLY-016 taken from MPR-ARCH-230 Appendix B
Photo 24	View northeast showing the treeline at the end of the field at the location of Smelt Brook taken from MPR-ARCH-230 Appendix B
Photo 25	View south of the falls feature identified near the confluence of Smelt Brook east and west branches at JRK-ARCH-189 Appendix B
Photo 26	View north of the fall feature identified near the confluence at JRK-ARCH-189 Appendix B
Photo 27	View north showing the identified high potential area JRK-POLY-018 taken from MPR-ARCH-234 Appendix B
Photo 28	View northwest showing the identified high potential area JRK-POLY-018 taken from MPR-ARCH-234 Appendix B
Photo 29	View southwest of the identified high potential area at MPR-POLY-017 taken at MPR-ARCH-233 Appendix B
Photo 30	View west looking at the other elevated terrace on the west side at MPR-POLY-016 taken at MPR-ARCH-233 Appendix B
Photo 31	View south-southeast looking at the elevated terrace on the west side at MPR-POLY-016 taken at MPR-POLY-233 Appendix B
Photo 32	View northwest from MPR-ARCH-232 showing the location of the high potential area JRK-POLY-017 Appendix B
Photo 33	View north from MPR-POLY-232 showing the location of the high potential areas JRK-POLY-017 and MPR-POLY-016 Appendix B
Photo 34	View northeast at JRK-ARCH-191 showing a short section of the west branch of Little Samon River.....Appendix B
Photo 35	View northeast at MPR-ARCH-235 showing that the watercourse is more of a forest drain.....Appendix B
Photo 36	View southeast overlooking a section of the quarry located south of Old Lawrencetown Road at assessment note JRK-ARCH-203 Appendix B
Photo 37	View west overlooking the quarry section located to the south of Old Lawrencetown Road from assessment note MPR-ARCH-254.....Appendix B
Photo 38	View north at the entrance for the section of the quarry located the north of Old Lawrencetown road at assessment note MPR-ARCH-244 Appendix B
Photo 39	View northwest from assessment note JRK-ARCH-199 overlooking the section of the quarry north of Old Lawrencetown Road Appendix B



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

Photo 40	View east from assessment note JKR-ARCH-199 overlooking the section of the quarry to the north of the Old Lawrencetown Road Appendix B
Photo 41	View west at a pile of large rip rap stones remaining within the quarry at assessment note MPR-ARCH-246 Appendix B
Photo 42	View of a section of the Old Lawrencetown Road, currently a public walking trail at JRK-ARCH-204 Appendix B
Photo 43	View north along the Miller Road in a quarry area at MPR-ARCH-251 Appendix B
Photo 44	View east from JRK-ARCH-202 down a woods road encountered in the middle of the PDA Appendix B
Photo 45	View north from JRK-ARCH-205 from the south end of grassy field.....Appendix B
Photo 46	View south from JRK-ARCH-205 at the end of the field Appendix B
Photo 47	View north at a section of LSF at JRK-HSF-012 created from field clearing Appendix B
Photo 48	View east of a LSF at JRK-HSF-013 created from field clearing activities and located within the treeline Appendix B
Photo 49	View east of a LSF at JRK-HSF-013 created from field clearing activities Appendix B
Photo 50	View south at MPR-ARCH-238 showing the north section of the field Appendix B
Photo 51	View southwest at JRK-ARCH-196 overlooking Boom Lake in an area identified as a watering hole or landing for water access Appendix B
Photo 52	View north of a trail and woods road from the old field which led to JRK-ARCH-196 located at the waters edge of Boom Lake Appendix B
Photo 53	View north from JRK-ARCH-206 at an old field encountered on the west side of Miller Road Appendix B
Photo 54	View south at the tree line having LSF at JRK-ARCH-206 which delineates the fields Appendix B
Photo 55	View southwest at MPR-ARCH-263 of a vacant lot which until recently still had farm and commercial & residential buildings Appendix B
Photo 56	View north at MPR-ARCH-264 at a twentieth century foundation feature at JRK-HSF-015.....Appendix B
Photo 57	View northwest at MPR-ARCH-264 at a corner of a twentieth century foundation feature Appendix B
Photo 58	View north at JRK-ARCH-208 showing some building present on the Akoma property.....Appendix B
Photo 59	View west at JRK-ARCH-208 of the open field encountered on the Akoma property Appendix B
Photo 60	View southwest from JRK-HSF-014 at concrete foundation features associate with the Akoma property Appendix B



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

LIST OF APPENDICES

Appendix A Figures
Appendix B Photographs



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

Project Personnel

Project Manager:	Shawn McFarlane, B.ScF., RPF
Background Research:	Jonathan Kyte, MA.
Site Visit:	Jonathan Kyte, MA., Mike Rooney, BA., Chase McLean, MA.
Report Writer:	Jonathan Kyte, MA.
GIS Specialist:	Megan Blackwood, Mike Rooney, B.A.
Quality Review:	Chris Blair, BA
Independent Review:	Robert Federico, MPA



1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Halifax Regional Municipality (HRM) to conduct an Archaeological Resource Impact Assessment (ARIA), for the HRM Future Serviced Communities Background Study, Akoma Lands Study Area, located in Westphal, Nova Scotia (the Project). An ARIA is required to determine if there are heritage resources that may be affected by future ground disturbance in relation to housing and transportation developments. The ARIA is part of the background study for environmental, land-use suitability, transportation, and infrastructure for the Westphal (Akoma Lands) study area.

HRM is planning to expand housing development approvals in the Akoma Lands Development Area to accelerate the provision of land for new housing. As part of the land-use suitability analysis, an ARIA must be completed to assess the potential for archaeological resources, including Mi'kmaw and African Nova Scotian communities, to be present and if so, to be affected by the Project. The ARIA consisted of background research, and a field-based archaeological survey (walkover). All work was completed in compliance with Nova Scotia's Archaeological Resource Impact Assessment (Category C) Guidelines (2014) as well as the *Special Places Protection Act* (Chapter 438 of the Revised Statutes, 1989).

The ARIA was conducted under Heritage Research Permit (HRP) No. A2023NS190 issued to Jonathan Kyte of Stantec. The fieldwork for the walkover component of the ARIA was conducted by Jonathan Kyte, MA, Mike Rooney, BA., and Chase McLean, MA., on November 20 to 22, and 29, 2023.

2.0 PROJECT DEVELOPMENT AREA

For the purposes of this report, the Project Development Area (PDA) is the area that may be affected by the potential housing development; this was the subject of the ARIA. This area mainly consists of undeveloped Akoma lands to the south side of Main Street in Westphal, Regional Municipality, Nova Scotia. HRM initiated the background study to establish the appropriate portion of the PDA that are suitable for new housing development and future community planning work. The total size of the PDA is approximately 450 ha. The PDA is identified with the red outline in Figure 1 (Appendix A).



3.0 METHODOLOGY

3.1 BACKGROUND RESEARCH

Stantec conducted desktop historical background research for the Project using digital and archival information available from various government and non-government sources including published, unpublished, and on-line historical and environmental records. The scope of work for the desktop historical background research included, but was not limited to, the sources of information listed below to gather information on general and specific history, including the Pre-Contact and Historic Periods, and known archaeological resources within the study area, to determine the potential for archaeological resources to be within the PDA:

- Review of relevant Maritime Archaeological Resource Inventory (MARI) forms for information relating to recorded archaeological sites within a 1 km radius of the PDA
- Review of previous archaeological investigations conducted within or near the PDA through consultations with Special Places Coordinator from the Nova Scotia Department of Communities, Culture, Tourism, and Heritage (NSCCTH)
- Review of historical maps and aerial photographs, maps, published sources, and historical and archival records of the PDA and adjoining properties to gain information on historical land use
- A review of the Canadian Register of Historic Places (CRHP)
- Engagement with the Kwi'mu'kw Maw-klusuaqn Negotiation Office's Archaeological Research Division (KMKNO's ARD) to gather information pertaining to traditional or historical use of the PDA
- Review of LiDAR and base mapping of the subject property to identify environmental and physiographic features such as topography and historic water margins that would influence human settlement and resource exploitation patterns
- Knowledge of the Stantec Archaeology Team
- Consultations with local historical experts, and archaeologist, as applicable

The results of the historical background research were used to identify leading archaeological and environmental indicators for the potential presence of archaeological resources within the PDA. The results of the research are presented in the sections that follow.

3.2 ARCHAEOLOGICAL WALKOVER

Stantec conducted the walkover of the PDA to identify, visually inspect, and document previously unknown heritage resources, and identify areas of elevated archaeological potential. The walkover was completed by two archaeologist via transects throughout the subject property to assess ground and topographical conditions. The findings of the walkover were documented, taking into consideration the results of the desktop historical background study, in accordance with the Provincial Guidelines (Category C, 2014), and based on the experience, knowledge and professional judgement of the Stantec Archaeology Team. Assessment notes were taken at reference points during the walkover for discussion and recorded into Field maps mobile phone application and labeled with the initials of the archaeologist and number of the assessment note (e.g., JRK-ARCH-####). Where areas of elevated archaeological



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

potential were identified, these locations were delineated using a mobile mapping device and labeled as polygons, with the initials of the archaeologist, "POLY", and the number of the polygon (e.g., "Polygon XXX-POLY-###"). During the walkover, and surface-visible cultural features were noted and recorded as appropriate. These locations were recorded and labeled as archaeological assessment notes, or as "historically significant features," and labelled. "XXX-HSF-###").

Field data were collected using a mobile phone device running field maps, a data collection and field mapping software developed by ESRI. Digital field maps were generated for the Project that combine relevant environmental and project data in GIS-based layers. A digital copy of all data collected in the field is provided in the Project Site Plan and with this report (Figure 2, Appendix A). Additional field data collected using Field Maps included tracklogs (Figure 4, Appendix A).

4.0 BACKGROUND RESEARCH RESULTS

This section details the results of the historical background research gathered on the geology, environment, and cultural and historical background review of the PDA.

4.1 THE NATURAL ENVIRONMENT

The PDA is located between the Eastern Shore and Quartzite Barrens Theme Regions. The southern section is within the Eastern Shore Beaches Theme Region (Theme Region 833). The bedrock in the area is dominated by graywacke, with bands of slate, folded parallel to the coastline. The coastline in this area is divided up into headlands separated by long inlets where most are drowned river estuary and are not fault-controlled. Loose cobbly quartzite till forms the ground moraine and is overlain by drumlin composed of red brown Lawrencetown Till and can be seen as an eroding coastal bluff at Hartlen Point (Davis and Brown 1996).

The PDA is part of a drowned coastline where Cole Harbour forms a headland. Due to its exposure, there is an active reworking of the coastal sediment which has built a barrier beach at Ranbow Haven formed by Cow Bay. The irregular shape of the coastline is actively being smoothed out having sediments redistributed where sand and gravel are supplied from the erosion of deep glacial tills and glacial outwash deposited on the coast. This forms spits and barrier beaches which protect the shallow estuaries from ocean waves which allow marshland to develop within this area. The soils consist of well-drained Halifax gravelly sandy loams derived from quartzite. "On areas of less relief, imperfectly drained Danesville soils is common, with peat, Rockland, and some small areas of poorly drained, mottled Aspotogan soil. Some areas of shaly loam Bridgewater soil have developed from parent material derived from slate. Finer textured Hantsport soils (imperfectly drained, sandy clay loam) which have developed from Carboniferous parent materials are found around Eastern Passage" (Davis and Brown 1996:199).

White spruce and balsam fir forests with maple and birch trees predominate the area. On abandoned farmlands and drumlins, pure stands of with spruce are common. Further inland, the forest changes to spruce, fir, and pine stands (Davis and Brown 1996).



The northern section of the PDA is within the Quartzite Barrens Theme Region (Theme Region 413). "The mantle of quartzite till ranges in thickness from 1 – 10 m in this Unit but averages less than 3 m. There are several areas of exposed rock where till has been scraped off by the glacial ice" (Davis & Brown 1996:56). The bedrock-dominated topography of these extensive barrens within this region is described as "ridge-swamp-swale." Where greater thickness of glacial till has accumulated, drumlins and drumlinoid till features are found (Davis & Brown 1996). In the Halifax area the many long sub-parallel faults create linear valleys are followed by rivers and sometime filled by lakes.

The area is covered in Halifax soils and well drained, stony, sandy loam, which developed on till derived principally from quartzite. The poorly drained associated Dansville soils occur in areas of lower relief, together with Aspotogan soils and peat. Also, some Bridgewater soils, derived from metamorphic slates are also located within the area (Davis & Brown 1996).

4.2 CULTURAL AND HISTORICAL BACKGROUND

4.2.1 PRE-CONTACT PERIOD

The earliest period of human occupation in Nova Scotia is *Sa'qewe'l L'nu'k* (the Ancient People) or "Palaeo-Indian" period (13,000 – 8,000 BP), which saw the arrival of peoples who harvested caribou, possibly along with a variety of other fauna, following deglaciation of the region (Bonnichsen, Keenlyside and Turnmire 1991; Deal 2023). This period is best represented in Nova Scotia by the Debert-Belmont site complex near Truro, NS.

Sites of the following *Mu Awsami Kejihaw'k L'nu'k* (the Not so Recent People) or the Archaic Period (8,000-3,000 BP), are characterized in part by distinctive ground stone tool industries. In Nova Scotia, sites of this period are known primarily from interior locations, and for the most part date only to the latter half of this period (the Late Archaic). Nevertheless, it is inferred that people were present in the province throughout this period, and that their lifeways included a focus on harvesting the resources of the coast as well as interior waterways. The scarcity of evidence for occupation early in the period and on the coast is seen to reflect the effects of rising sea levels; such sites are now situated in marine environments.

The last phase of the Pre-Contact Period, *Kejihawek L'nu'k* (the Recent People) or Woodland/Ceramic period (3,000- 500 BP), sees the appearance of ceramic technology in the context of wide-ranging interactions with other peoples of the greater northeast. Coastal archaeological sites are more clearly documented (albeit still threatened by rising sea levels and coastal erosion) and, in some cases, include substantial shell middens, indicating the harvesting of marine shellfish. Nevertheless, both marine and terrestrial resources figured in the seasonal round during this time, with some regional variation (Nash and Miller 1987; Davis 1991).

The PDA is within an area that once was part of a greater Mi'kmaw territory known as *Eskikewa'kik*, meaning "Skin dressers" (CMM 2007). The coastlines, Islands, bays, harbours, and water systems would have been an important transportation route and resource base of the local Mi'kmaq and their ancestors for a long time prior to the founding of Halifax. A research inquiry was submitted for the PDA with KMKNO-ARD and their review revealed three traditional use sites within a one-kilometre distance of the



HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS) ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS (2023)

PDA used for fishing, encampment, harvesting, and ceremonial uses, but not within the PDA. There are three Mi'kmaw archaeological sites within a 5 km distance to the PDA: BeCu-03, BeCv-14, and BeCv-17 are recorded diagnostic lithics and petroglyphs (KMKNO-ARD 2024) (see Section 4.2.3). The Mi'kmaw name for Dartmouth is *Punamu'kwati'jk*, which means “at the tomcod place” and the name of Cole Harbour is *Wanpa'q*, which means “still water.” Mi'kmaw methods for naming a place is verb based, frequently reflecting the meaning of the area to the Mi'kmaq, such as resources available or the landscape features of the area. This type of naming relies on an intimate understanding and repeated use of an area (KMKNO-ARD 2024). The PDA is located approximately 5 km to the northeast of the Cole Harbour Indian Reserve No.30 and is the closest Mi'kmaw community to the PDA. It is situated between Morris and Bassitt Lakes.

Historic references were made in 1864 of reports that shell middens became exposed in fields within the area that were frequently plowed (KMKNO 2024), indicating these areas were previously occupied into the Pre-Contact Period. At the turn of the twentieth century, Morris Lake was referenced as being named after an old Mi'kmaq family (Maurice) who resided at the outlet of Morris Lake for a long time. The Mi'kmaw name for Morris Lake is *Loocktush*, which means “place of scaffold or drying fish,” suggesting the area was used for this purpose (KMKNO-ARD 2024). By 1881 the Census of Canada records noted 33 Mi'kmaq families residing in Dartmouth which represents a continuous presence within the PDA of Mi'kmaw peoples into the Historical Period.

4.2.2 HISTORIC PERIOD

The Historic Period is defined as the period from the arrival of mostly European-derived peoples to North America, approximately 500 years ago, until the modern era. For Mi'kmaq communities, this period is referred to as *Kiskukew'k L'nu'k* (Today's People) or Contact Period (500 BP- Present), which saw the growth of European settlement in the region, and with it, a variety of changes for *Kiskukew'k L'nu'k* associated with trade, conflict, and disease (Whitehead 1991).

The first European population to have a presence at the mouth of Halifax Harbour were the Acadians during the late seventeenth century. There was some seasonal use by New Englanders during the first half of the eighteenth century for the fishery, although, there was not a large population of European settlement until the British founded Halifax in 1749. The community of Dartmouth was founded a year after on the east side of Halifax Harbour. The PDA is located between the communities of Westphal, Preston, and Cole Harbour in Dartmouth.

The community of Westphal, along the north of the PDA, is a suburb on the south side of Lake Micmac. The community was known as Preston Road until its current name, Westphal, was given in 1935 to honour two brothers named Westphal, born near Salmon River, who became Admirals of the Royal Navy (PANS 1967). A 180-acre lot was surveyed for John Wisdom and Edward King in 1785 and settled around this time and remained a small rural community until the post World War II population boom. The St. John's Anglican Church in Preston was consecrated in 1791 and a second church, built in 1828, burned in 1849. A third St. John's Church was built in 1850 (PANS 1967). The communities of Westphal and Preston are located just outside the PDA.



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

The community of Preston, located to the northeast of the Study Area, was named after Preston in Lancashire, England, which also had a parish church named St. John's. "The Township of Preston was granted in 1784 to Theophilus Chamberlain and others, mostly Loyalists and disbanded soldiers. Among those who actually settled (as opposed to those who received grants but did not settle) in the township were Stayner, Greenwood, King, Allan, Smith, Russel, and Wisdom" (PANS1967:560). In 1785 many freed American slaves (Black loyalists) were resettled in the Preston Township although (1,200) of them left in 1792 to resettle in Sierra Leone (CRM 2016). Four years later, in 1796, approximately 500 maroons, descendants of Spanish slaves, were expelled from Jamaica to Nova Scotia, and resettled on lots purchased for them within the Preston Township. Many of these people also left for resettlement in Sierra Leone in 1800. During the War of 1812 many American slaves were brought to Halifax and by 1816 approximately 924 people were settled at Preston on former maroon lands. In 1841 these settlers of Preston petitioned for a clear title to their land (PANS 1967).

The community of Cole Harbour is located to the south of the PDA. The name was first referenced on a land grant for 3,000-acres made to Benjamin Green and others in 1765. Another grant for 600-acres was surveyed for George Bisset and George Harper, south present-day Cole Harbour. Fishing and farming were the main means of livelihood within the community (PANS 1967).

A review of historical maps was conducted for the properties within the PDA which indicated that seven historic land grants were issued. The northern section of the PDA was a part of the Preston Township under Plantation lots in letter 'A' No. 1 Issued to Mr. Jordon and No.8 issued to Mr. Chamberlain in 1786 (PANS 1786). A portion of Philp Linzi Plantation Lot in Preston contained a small annex parcel within the northern section of the PDA originally granted in 1786, (Crown Record Book 18 page 86). Two lots in the south section of the PDA were a part of a division of land for the Rost and Morash Families in Cole Harbour in 1808. Lot #1 was issued to Jim Morash containing 102 acres along Smelt Brook and Lot #3 was issued to John Morash consisting of 101 acres (Crown Records Displaced Plan No. 305). A section in the western part of the PDA was a part of a grant made out to Benjamin Green (Crown Records Book 6 Page 510). Another historic land grant was a subdivision of the Upper Lawrencetown lot (Lot # 2) taken possession by Frances Green in 1877, (Crown Records Sheet #66) and located in the southeastern section of the PDA.

It is not known when the granted lots within the PDA were actually settled, but it is believed to be around the turn of the nineteenth century. Settlement features or buildings were noted in the north section of the PDA along Old Miller Road on a road map from Dartmouth to Musquodoboit dating to 1800 (Crown Records Displaced Plan No. 357), (Figure 5, Appendix A). The map has a reference to W. Miller residing in a home on the corner of Preston Road (Highway107) and on the east side of Old Miller Road. It is likely that the road was named after this resident. Two more buildings were noted, one along the Old Miller Road on the west side and the other along Highway 107 in the northeast corner of the PDA. Another road map from Dartmouth eastward drafted by John Chamberlan in 1813, (Figure 6, Appendix A) shows buildings in the same footprints as the previous plan (Crown Records Displaced Plan No. 264). Later historic maps show settlement features within the PDA in both the north and south sections (Church 1865; Figure 7, Appendix A). In the north, records show one house occupied by W. Elliot along Highway 107 on the corner with Old Miller Road, another house occupied by J. Stevens, on the west side of Old Miller Road and three houses on the east side occupied by W. Ross, T. Miller, and J. Janus, and one



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

house occupied by G. Morish in the south section of the PDA. By the turn of the twentieth century there were two houses remaining in the north, one on either side of Old Miller Road and the single home along Cole Harbour Road in the south (Faribault 1908; Figure 8, Appendix A).

The property on the corner of Highway 107 and the west side of Old Miller Road was identified as the Nova Scotia Home for Colored Children (NSCC) and now occupies the (Akoma) properties situated on 212 acres of land and located within the PDA. The NSCC was originally incorporated under a private members bill in the Nova Scotia House of Assembly in April of 1915 (NS 2019). The school was set up to take up provision of care for neglected and destitute African Nova Scotian children. By 1919 a location was identified for the Home and a farm site near the African Nova Scotia Community of Preston and the property was purchased by the province (NS 2019). The school opened in 1921 and operated as a working farm in the decades to follow as seen in aerial photos (NSDNR 1945, 1954, 1964; Figures 9 to 10, Appendix A), showing several outbuildings and fields. The main Home was also completed in 1921 and used until 1927 when the school moved from the main building to the remodeled farmhouse. Significant investment was made into the property between 1921 and 1961 and several outbuildings and improvements made (NS 2019). In June of 2022 the Akoma property at 18 Wilfred Way, Westphal was registered within the Registry of Heritage Properties for Halifax Regional Municipality (HRM 2022). A research report written by Beaupre-McPhee, a research planner with HRM, was submitted as a part of the application. The research report gives a thorough background on the property and is referenced as a stand-alone document (Beaupre-McPhee 2022).

Review of aerial photographs showed other properties were developed within the north section of the PDA. One is a small farm and a horse track, which was constructed sometime between 1954 and 1964. (NSDNR 1954, 1964). A late twentieth century quarry operated within the PDA, located near the southeastern end of Old Lawrencetown Road in Cole Harbour. As viewed from aerial photographs the quarry began operations between 1954 and 1964 (NSDNR 1954, 1964). The quarry is known as Tryner's Pit and was used by a local contractor Tryon Construction Limited for gravel in relation to construction projects for the Department of National Defence (DND) beginning in the late 1950s and mostly extracted gravel for concrete (Hudak 2014). The quarry appears in aerial photographs by 1964 and showed that it expanded into the 1970s and ended operations sometime during the 1990s (NSDNR 1964, 1974).

A review of the Canadian Register of Historic Places (CRHP 2024) found two registered historic places or heritage sites located within 5 km of the PDA. The first registered heritage building is the John Sailsbury House (1830) which is located on Summit Street in Dartmouth and to the west of the PDA. The second is the Cole Harbour Meeting House (1830-1831) being a one-story Methodist Chapel located on a lot of land originally purchased for the Jamaican Government resettlement of the Maroons in 1797. The meeting house is located on the Cole Harbour Road to the south of the PDA.



4.2.3 REGISTERED ARCHAEOLOGICAL SITES NEAR THE PDA

A review of the NSCCTH MARI online database indicates that there are twelve registered archaeological sites within a 5 km radius, but outside of, the PDA. These sites are: BeCv-14, BeCv-17, BeCu-01, BeCu-02, BeCu-03, BeCu-04, BeCu-08, BeCv-21, BdCu-03, BdCu-04, BdCu-05, and BdCu-06. Two of the registered archaeological sites (BeCu-03, BeCv-14) date to the Pre-Contact Period. One historic Mi'kmaw petroglyph site (BeCv-17) and nine other historic sites (BeCu-01, BeCu-02, BeCu-08, BeCv-21, BeCu-04, BdCu-03, BdCu-05, and BdCu-06) date to the Historic Period. Information on each site is presented below.

BeCu-03 consists of an isolated pre-contact artifact find along the Little Salmon River and dated to the Archaic Period (Piers 1895). The site is located approximately 200 m to the east of the PDA. The Chambers site (BeCv-14) consists of a diagnostic pre-contact projectile point that dating to the Paleo-Period registered by David Christianson (1986). The site is located close to Lake Micmac and near a known petroglyphs site (BeCv-17) located west approximately 4.5 km from the PDA. The petroglyphs site was interpreted as possibly dating to the Historic Period (Whitehead 1993).

The closest Historic Period site is located approximately 200 m from the northeast corner of the PDA, (BeCu-01) and consists of an exposure of artifacts in context with eighteenth and nineteenth century settlement of the area. The finds were exposed during construction of a new road at Bainbridge Court, a cul-de-sac which extends south from Crain Hill towards highway 107 and was registered in 1987 (Preston 1987). BeCu-02 is located approximately 1.2 km from the northeast corner of the PDA on Crain Hill Road. The site consists of surface features interpreted to be from St. John Anglican Church (1788-1822) (Davis 1987). BeCu-08 is the Governors Farm located in Preston and approximately 3 km northeast of the PDA. This site was originally the country estate of Sir John Wentworth, and later the Colley family homestead occupied during the late eighteenth to early nineteenth centuries (Preston 1993). BeCv-21 is an Historic Period site registered as the Morris Montague site located approximately 2.5 km to the northwest of the PDA. The site consists of settlement features relating to the Morris estate including two house foundations situated on a landscaped hill overlooking the lake (Preston 1993).

The registered archaeological sites BeCu-04, BdCu-03, BdCu-05, and BdCu-06 date to the Historic Period and were identified to the south of the PDA situated between Cole Harbour and Bissett Lake. These sites relate to Historic Period settlement (Powell 1990). The Old Country Home Complex (Poor's Farm) (BeCu-04) consist of six separate sites located approximately 600 m to the south of the PDA along the west side of Cole Harbour and dating to the late nineteenth century. The sites include four possible building locations, a reservoir, and a cemetery. The Ware Inn (BdCu-03) is 1 km to the south of the PDA and located within the Cole Harbour Heritage Park. The Inn site was identified from the Faribault map (1909) also dating to the late nineteenth century. BdCu-04 site is the Costly House located approximately 1.6 km south and situated on the west side of Cole Harbour; this site dates to the middle to late nineteenth century. The remaining sites identified are the George Bassett House (BdCu-05) and the Hezekiah Bissett House (BcCu-06) both located approximately 2 km south of the PDA. These sites consist of archaeological features related to nineteenth century settlement within the area and situated on the high ground in a wooded area west and south of Bassitt Road and the old railway bed (Powell 1990).



4.2.4 PREVIOUS ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENTS

Four previous ARIAs were carried out to the south the PDA and two recent ARIAs have been conducted for locations north and south of the PDA. Six reports provided to Stantec by NSCCTH staff indicated that four of the previous ARIAs were related to the Poor's Farm Cemetery located within the Cole Harbour Heritage Park on Bissett Road, located outside the PDA (MacLeod-Lesile 2006, 2007; Kingston 2008, 2009).

Two recent ARIAs reports provided by NSCCTH Staff were completed in proximity to, but not within, the PDA. One of these ARIA reports was related to the Lake Major dam replacement archaeological testing carried out by CRM Group Ltd. (CRM) conducted in 2016 for Halifax Water. The other ARIA was for the Cole Harbour Long Term Care Facility ARIA by Davis MacIntyre & Associates (DMA) in 2023. No previous archaeological resource impact assessments have been conducted within the PDA. Relevant, information provided by these ARIAs is presented below.

5.0 FIELD SURVEY RESULTS

The walkover covered a broad portion of the PDA with specific attention to areas of interest identified during the background review. These areas of interest included: sections of two watercourses that drain into Cole Harbour; a quarry, and associated features; section of the Old Lawrencetown Road and Old Miller Road; and historic settlement features identified in the northern section of the PDA. The results of the walkover including assessment notes referenced in the text can be seen in Figure 2 (Appendix A). Archaeological potential areas are identified in Figure 3 (Appendix A), and the tracklogs from the walkover are overlayed over a LiDAR hill shade rendering of the PDA in Figure 4 (Appendix A). The walkover survey focused on areas of interest identified during the background review and not on previously impacted areas associated with past quarrying and forest harvesting although these areas were still covered. Spacing of the tracklogs in areas identified as potentially being impacted, was determined based on the excellent visibility (i.e., < 60 m), and in consideration of the overall poor conditions resulting in determination of low archaeological potential due to undulating rocky areas having a slope < 25° and in low, wet, boggy and or marsh conditions. The walkover focused on two watercourses where both banks were walked over (at 0 – 30 m spacing) to assess the archaeological potential.

5.1 WATERCOURSES

The first part of the walkover focused on two watercourse systems that empty into Cole Harbour, located in the south section of the PDA: East and West Branches of Smelt Brook and a short section of the West Branch of the Little Salmon River.



5.1.1 Smelt Brook: East & West Branch

The walkover began in Cole Harbour along a section of the East Branch of Smelt Brook that runs from Broom Lake, located in the northern section of the PDA, south down to Cole Harbour. The watercourse (Photo 1, Appendix B) was crossed at a small pedestrian bridge at assessment note JRK-ARCH-180 and the walkover commenced in a northward direction along the west side of the watercourse. Forest conditions consisted mostly of an immature birch and maple forest mixed with softwoods. Ground conditions were undulating with poor soil development within the area. An old trail was encountered with a north to south orientation and follows the watercourse. The trail appears to be associated with the historic fields located to the south of assessment note JRK-ARCH-181, (Photo 2, Appendix B).

Continuing north, the terrain was very rocky consisting of boulder swales and having an undulating surface. The watercourse was small with no well-defined banks although the watercourse was swollen at the time of the walkover due to seasonal rain. Further north along the east branch of the watercourse, (JRK-ARCH-182; Photo 3, Appendix B), the forest opened and changed to mostly immature birch and maple growth. The area showed signs of past forest harvesting activities within this section of the PDA although some old hardwood trees remain, possibly indicating selective harvesting (an older practice), as opposed to clear cutting (typically a more recent forest harvesting practice). Further north the terrain changed to a wetland environment (JRK-ARCH-183; Photo 4, Appendix B). A modern deer stand constructed of tarpaper and boards was encountered at JRK-ARCH-184 (Photo 5, Appendix B). At the Old Lawrence Town Road, the watercourse opened into a wider wetland environment at assessment note JRK-ARCH-185 (Photos 6 and 7, Appendix B).

At assessment note JRK-ARCH-193 (Photos 8 and 9, Appendix B), the ground was found to be very rocky and very undulating and showed signs of recent storm events as the area had numerous of downed trees. Several tree falls were inspected and the area was found to have little or poor soil development and no traces of pre-contact lithics and historic artifacts observed. Overall, this section of the PDA along this section of the East Branch of Smelt Brook was found to be low in archaeological potential.

The northern section of the East Branch Smelt Brook from Boom Lake at assessment note MPR-ARCH-240 (Photos 10 and 11, Appendix B) was found to be low and wet. Forest conditions consist of mostly immature to mature mix of softwood and hardwoods. The small watercourse widened out at CMK-ARCH-164 (Photo 12, Appendix B) and surface conditions continued to be very rocky and undulating. A timber frame bridge abutment was encountered at the same assessment note (Photo 13, Appendix B) on a woods road. It was not possible to date the bridge, based on aerial photographs and the condition of the timbers in the abutment suggest recent use within the last 25 years for quarry and forest harvesting access. Bridges of this type and construction would be ubiquitous in the area and this one is not considered historically significant. Further down Smelt Brook the area showed signs of impact from recent storm events with numerous blown down trees and debris encountered at MPR-ARCH-242 (Photo 14, Appendix B). The area around the watercourse then transitioned into a wetland environment south and downstream to the Old Lawrencetown Road. The northern section of the East Branch Smelt Brook was found to be low in archaeological potential due to surface and topographical conditions noted during the walkover.



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

West Branch Smelt Brook was walked over from the northern end. A recently excavated drainage channel (ditch excavated and filled with stone) was noted at assessment note MPR-ARCH-227 (Photos 15 and 16, Appendix B) where the northern end of the West Branch Smelt Brook emerges out of the drainage feature. The drainage channel appears to have been created to redirect water away from nearby houses located to the west of this location and forms the start of the West Branch. The West Branch Smelt Brook was walked over on both sides downstream to the confluence with the East Branch Smelt Brook before it empties into Cole Harbour. The terrain was found to be undulating, very rocky, low, wet in areas and consisting of mostly alder growth and immature birch trees mixed with softwood. The terrain began to have a slope $> 20^\circ$ on the west side of West Branch Smelt Brook towards the southwest (MPR-ARCH-228; Photos 17 to 18, Appendix B). The walkover continued downstream, where conditions showed signs of past forest harvesting activity. A line of mostly immature softwoods bordered both sides of the watercourse in this section. Further down the watercourse, at assessment note JRK-ARCH-188 (Photos 19 and 20, Appendix B), the entrance to the old trail (at JRK-ARCH-181) previously mentioned above was encountered at the end of an old farm field. The West Branch Smelt Brook above the confluence with East Branch Smelt Brook, was found to be low in archaeological potential due to wet or sloping surface conditions encountered during the walkover.

5.1.2 Smelt Brook: Confluence and Lower End

The walkover continued onto the old farm field to the west of the confluence between the West and East branches of Smelt Brook. A medium potential area was identified at MPR-POLY-016 (MPR-ARCH-231; Photos 21 and 22 & MPR-ARCH-230; Photo 23 and 24, Appendix B) and consisted of a flat terrace overlooking the Smelt Brook with a good view of Cole Harbour. It is considered to have elevated potential for use and/or occupation during the Pre-Contact as well as Historic Periods.

Continuing from the east side of the confluence where a small waterfall was encountered at assessment note JRK-ARCH-189 (Photos 25 and 26, Appendix B), forest conditions consist of mostly immature to mature birch growth mixed with other softwood trees. The terrain is undulating and very rocky in this location. The presence of the confluence of the watercourses and the waterfall feature (often an area where fish gather before trying to get over the falls), elevates the archaeological potential of the relatively flat and level dry area identified on the east side of Smelt Brook. The area was delineated as JRK-POLY-018 (MPR-ARCH-234, Figure 2, Appendix A; Photos 27 and 28, Appendix B). It is interpreted as a floodplain for the confluence of Smelt Brook. Two other areas were identified as having high archaeological potential within the old field along the east side of East Branch Smelt Brook consisting of an upper and lower terrace. The high, terrace overlooking the confluence of the East and West Branches of Smelt Brook and was labeled MPR-POLY-017 (MPR-ARCH-233; Photos 29 to 31, Appendix B). The lower terrace is identified as JRK-POLY-017 (MPR-ARCH-232; Photo 33, Appendix B). If these areas cannot be avoided by future development, it is recommended they be subject to archaeological shovel testing. These three elevated archaeological potential areas can be seen in Figure 3 (Appendix A).



5.1.3 Small Section of the West Branch of the Little Salmon River

Only a small portion of the West Branch Little Salmon River was located within the southeastern area of the PDA (JRK-ARCH-191; Photo 34, Appendix B) PDA. In this area, the watercourse was found to be little more than a forest drainage with no defined banks. Forest conditions in this area consist of a mix forest tree species (MPR-ARCH-235; Photo 35, Appendix B). The area is low, wet, very rocky, and with an undulating sphagnum moss cover forest floor. This area was found to be low in archaeological potential and not suitable for past occupation or other activities that would leave an archaeological footprint.

5.2 HISTORIC AND MODERN FEATURES

During the background review two roads as well as features relating to settlement from the Historic Period were identified primarily within the northern section of the PDA. Land use in most of the PDA during the recent past has been limited to forest harvesting with gravel and rock quarrying in the southeast corner of the PDA. The sections that follow present information on these segments of the walkover.

5.2.1 Quarry and Associated Features

The largest anthropogenic feature in the landscape encountered during the walkover was a former quarry located in the southeast corner of the PDA near the end of the Old Lawrencetown Road in Cole Harbour (As seen in 1964 aerial photo, Figure 11, Appendix A). The large open pit quarry had two sections: one section south of the Old Lawrencetown Road and another to the north. The extent of the quarry was evidence in the surface disturbance noted during the walkover.

The south section consisted of a large open pit quarry as encountered at assessment notes JRK-ARCH-203 (Photo 36, Appendix B) and MPR-ARCH-254 (Photo 37, Appendix B). The north section of the quarry is located north of the Old Lawrencetown Road; this section was accessed through a rocked off quarry road orientated north-south (MPR-ARCH-244; Photo 38, Appendix B). The surface conditions consisted of primarily alder growth, being a mix of immature birch and other softwood trees (JRK-ARCH-199: Photos 39 and 40, Appendix B). The area was found to be low, wet, and very rocky and heavily impacted north along the quarry road. A large pile of rip rap or armor stone was located at assessment note MPR-ARCH-246 (Photo 41, Appendix B). Evidence of continued forest harvesting activity was also observed while walking over the north section. The quarry was closed in the 1990s. Overall, both sections of the quarry within the PDA are low in archaeological potential due to impact to the area encountered during the walkover.

5.2.2 Historic Roads and Other Settlement Features within the PDA

Two historic roads were noted during the background research and considered during the walkover assessment. In the southern portion of the PDA there is a section of the Old Lawrencetown Road stretching from east to west that is currently used as a public walking trail (JRK-ARCH-204; Photo 42, Appendix B) between Cole Harbour and the residential development around Auburn Drive. The other historic road within the PDA is the Old Miller Road which stretches north to south and intersects the Old



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

Lawrencetown Road in the south section of the PDA (Figure 8, Appendix A). This road was found to have had recent use, mostly related to forest harvesting, quarrying, and recent recreational ATV use such as at MPR-ARCH-251 (Photo 43, Appendix B). Various other woods roads were also walked encountered and walked over (JRK-ARCH-202: Photo 44, Appendix B). These were also related to tree harvesting and quarrying activities for sand and stone as observed in the landscape. Overall, the area around assessment note JRK-ARCH-202 was found to be low in archaeological potential due to surface conditions encountered. Surface conditions mostly consisting of very rough, undulating, and rocky terrain would not have been favourable for settlement or use.

The northern section of the PDA contained Historic Period features relating to settlement off Highway 107. The location of several buildings identified by surnames relevant to the local African Nova Scotia Community were noted on the Church Map of 1865. The first features encountered were at a turn in the transmission line approximately 400 m west of Old Miller Road, that intersects the PDA in the north section and consists of a long grassy field or old pasture on a drumlin to the east of Broom Lake at assessment note JRK-ARCH-205 (Photos 45 and 46, Appendix B). The southern end of the field was delineated with linear stone features (LSF) located within the tree line along the southern boundary of the field. These LSF were interpreted as being created during field clearing activities. Examples of these features can be seen at JRK-HSF-012 (Photo 47, Appendix B) and JKR-ARCH-013 (Photos 48 and 49, Appendix B). The field can be seen in the 1945 aerial photograph (Figure 9, Appendix A). At MPR-ARCH-238 (Photo 50, Appendix B) a woods road or trail was noted that led east to a historic farm located at the corner of Old Miller Road and Highway 107 at the Akoma property. It appears the field expanded to the south between the 1940s and 1950s (NSDNR 1945, 1954). The trail leads west down to Broom Lake from the field at assessment note JRK-ARCH-196 (Photo 51 to 52, Appendix B). The trail from the field met another trail from the north to the water's edge in this location and is interpreted as a landing for water access. The trail leads to the HRM properties located in the northwest corner of the PDA and in the direction of Cherry Brook located across Highway 107.

Several buildings are noted on the A. F. Church Map (1865) in the northern section of the PDA along Old Miller Road and Highway 107, (see Figure 14, Appendix A). Another pasture or old field was encountered during the walkover on the east side of Old Miller Road at JRK-ARCH-206 (Photos 53 to 54, Appendix B). This section of field was also delineated with LSF features marking the edges of the field at the tree line that surrounds the field. The field was noted in aerial photos from the middle of the twentieth century and appears to have been used recently (i.e., within the last twenty years). A nearby horse track was noted in aerial photos was encountered during the walkover in the northeast section of the PDA. The associated farm, commercial and residential property was walked over and found vacant (MPR-ARCH-263; Photo 55, Appendix B). The buildings in this location were recently removed but their concrete foundations were still onsite.

The largest concentration of features from the Historic Period were encountered within properties concentrated to the south of Wilfred Jackson Way located along Highway 107 and Old Miller Road in the north section of the PDA. A concrete foundation feature was encountered along Old Miller Road at MPR-ARCH-264 (Photos 56 and 57, Appendix B) and noted as JRK-HSF-015. The feature measured approximately 10 m (north-south) by 15 m (east-east) and appeared to date to the early to mid-twentieth century. The feature was interpreted as being associated with the NSCC (1921-1980) of the Akoma property and can be seen in Figure 12, (Appendix A). This area is still open fields and had some standing



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

buildings at JRK-ARCH-208 (Photos 58 and 59, Appendix B). Another concrete foundation feature was noted at JRK-HSF-014 (Photo 60, Appendix B) and was interpreted as being in context with the Akoma property as noted on Figure 12. The area of the Akoma property has been assessed as having elevated potential for encountering additional Historic Period remains. If this area will be affected by groundbreaking activities, then a more detailed survey of this area will need to be undertaken. Overall, the northern section of the PDA was found to have low potential for Pre-Contact Period occupation and use. However, the area was used during the Historic Period into modern times for settlement, farming, and forest harvesting activities, associated with the local African Nova Scotia community.

6.0 SUMMARY AND RECOMMENDATIONS

In general, the majority of the PDA was found to have low archaeological potential due to surface and topographical conditions encountered during the walkover that were generally unsuitable for habitation or other activities that would leave an archaeological footprint, and further supported by the results of the background research. The areas that were identified to have potential for the presence of Pre-Contact and Historic Period archaeological resources were in the northern and southern areas of the PDA. In the north, the evidence of the former Home for Colored Children occupying the Akoma property as well as other areas containing historic remains associated with settlement along Highway 107 and Old Miller Road were identified. Within the south, four areas of elevated archaeological potential were identified around the confluence of the east and west branches of Smelt Brook before empties into Cole Harbour and situated on two flat terraces within historic period agricultural fields overlooking the watercourse. If these areas are to be impacted from groundbreaking activities associated with the development of this area, then the following is recommended:

- 1) HRM has informed Stantec that the cellar feature identified as JRK-HSF-015 will be impacted by the development of a new access road along the Old Miller Road right-of way. Based on consultation with CCTH if this cellar feature is to be impacted, archaeological shovel testing must be completed at the cellar location and the results reported to NSCCTH prior to construction impacts. Depending on the results of the shovel testing additional mitigation may be required.
- 2) If the former Akoma property (registered HRM heritage property) as well as the historic features along the Old Miller Road and in the north section of the PDA (JRK-ARCH-206, MPR-ARCH-263, JRK-HSF-012, JRK-HSF-013) are to be impacted (also see "Dwelling/House" features identified on Figure 13, Appendix A), then it is recommended that a more detailed archaeological assessment be undertaken with archaeological shovel testing and other mitigation be implemented if these features cannot be avoided. Details on the scope and nature of this mitigation will need to be confirmed through consultation with NSCCTH prior to the implementation of the mitigation.
- 3) If the areas of elevated archaeological potential identified during the walkover located within the south section of the PDA (MRP-POLY-016, MRP-POLY-017, JRK-POLY-017, and JRK-POLY-018, Figure 3, Appendix A) cannot be avoided, then archaeological shovel testing is recommended to determine if archaeological resources are present and facilitate the design of appropriate mitigation for such resources if they are present.



HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS) ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS (2023)

It is important to note that while no Pre-Contact Period archaeological resources were identified during the field assessment, there is still potential for sub-surface archaeological resources to be present throughout the PDA. If any archaeological resources are discovered during ground-breaking activities, contractors or HRM are required to contact NSCCTH to assess the discovery and develop appropriate mitigation.

7.0 CLOSING

This report has been prepared as a requirement of Heritage Research Permit No. A2023NS190 for the sole benefit of HRM and may not be used by any other person or entity, other than for its intended purposes, without the express written consent of Stantec Consulting Ltd. (Stantec) and HRM. Any use which a third party makes of this report is the responsibility of such third party.

The information and recommendations contained in this report are based upon work undertaken in accordance with generally accepted scientific practices current at the time the work was performed. Further, the information and recommendations contained in this report are in accordance with our understanding of the Project as it was presented at the time of our report. The information provided in this report was compiled from existing documents, design and planning information provided by HRM, data provided by regulatory agencies and others, as well as the field survey carried out in 2023 specifically in support of this report. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, Stantec requests that we be notified immediately, and permitted to reassess the conclusions provided herein. Any follow-up work recommended in this report must be reviewed and approved by Special Places, the Nova Scotia Department of Communities, Culture, Tourism, and Heritage.

8.0 REFERENCES

- Beaupre-McPhee, Carter. 2022. *Research Report Former Nova Scotia Home for Colored Children, 18 Wilfred Jakson Way, Dartmouth*, prepared by HRM Planning and Development, HRM, Halifax.
- Bonnichsen, R., D. Keenlyside, and K. Turnmire. 1991. Palaeo-Indian Patterns in Maine and the Maritimes. In *Prehistoric Archaeology in the Maritime Provinces: Past and Present Research, Reports in Archaeology 8*. Edited by M. Deal and S. Blair, pp. 1-36. Fredericton: Council of Maritime Premiers Committee on Archaeological Cooperation.
- Christianson, David. 1986. *Chambers site*, Maritime Archaeological Resource Inventory form for the registry of BeCv-14.
- Church, A.F. 1865. *Topographical Township Map of Halifax County, Nova Scotia*. Halifax: A.F. Church & Co.



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

- Confederacy of Mainland Mi'kmaq (CMM). 2007. *Kekina'muek: Learning about Mi'kmaq of Nova Scotia*. Donald M. Juien (Ex. Dir.) Government of Canada, Human Resources and Social Development Canada, Turo, NS. Accessed on November 7, 2023, <https://native-land.ca/wp-content/uploads/2018/06/Mikmaq_Kekinamuek-manual.pdf>
- Cultural Resource Management Group Limited (CRM). 2016. *Lake Major Dam Replacement Project Archaeological Shovel Testing 2016 Halifax Regional Municipality Nova Scotia*, Final Report, conducted under Heritage Research Permit A2016NS58. Manuscript report submitted to the Nova Scotia Department of Communities, Cultural, Tourism and Heritage, Halifax NS.
- Davis, Stephen A. 1987. *St. John's on-the-hill* site, Maritime Archaeological Resource Inventory form for the registry of BeCu-02.
- Davis, Stephen A. 1991. The Ceramic Period of Nova Scotia. In *Prehistoric Archaeology in the Maritime Provinces: Past and Present Research, Reports in Archaeology 8*. Edited by M. Deal and S. Blair, pp. 1-36. Fredericton: Council of Maritime Premiers Committee on Archaeological Cooperation.
- Davis, Derek S., Browne, Sue. 1996. *The Natural History of Nova Scotia. Vol 2. Theme Regions*. Nimbus Publishing and the Nova Scotia Museum, Halifax.
- Davis MacIntyre & Associates (DMA). 2023. *Cole Harbour Long Term Care Facility, Archaeological Resource Impact Assessment*, conducted under Heritage Research Permit A2023NS046. Manuscript report submitted to the Nova Scotia Department of Communities Culture, Tourism and Heritage, Halifax NS.
- Deal, Michael. 2023. *Archaeology and The Indigenous Peoples of the Maritimes*, Memorial University Press.
- Faribault, E. R. 1908 / 1909. *Province of Nova Scotia, Halifax County, Lawrencetown Sheet #67*. Geological Survey of Canada. Geological Map.
- Halifax Regional Municipality (HRM). 2022. *Item No. 9.1.3 Heritage Advisory Committee*, Case H00534: Request to include 18 Wilfred Jackson Way, Westphal, in the Registry of Heritage Property for the Halifax Regional Municipality, Halifax.
- Hudak, Magen. 2014. *"Cow Bay's Ocean Playground," The Shifting Landscape of Siler Sands Beach, 1860's – Present*, A Thesis Submitted to Saint Mary's University for the Degree of Master of Arts in Atlantic Canadian Studies, Halifax NS.
- Kingston, Sarah. 2009a. *Poor's Farm Dormitory Excavations 2008 Bissett Road, Cole Harbour*, conducted under Heritage Research Permit A2008NS55. Manuscript report submitted to the Nova Scotia Department of Communities Culture, Tourism and Heritage, Halifax NS.
- Kingston, Sarah. 2009b. *Poor's Farm Dormitory Excavations 2009 Bissett Road, Cole Harbour*, conducted under Heritage Research Permit A2009NS75. Manuscript report submitted to the Nova Scotia Department of Communities Culture, Tourism and Heritage, Halifax NS.



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

Kwilmu'kw Maw-klusuaqn Negotiation Office's - Archaeology Research Division (KMKNO-ARD). 2024. Response to request for information for traditional or historic Mi'kmaq land use via dated, February 14, 2024.

Maclead-Leslie, Heather. 2006. *Poor's Farm Cemetery: Bisset Road, Cole Harbour*, conducted under Heritage Research Permit A2006NS55. Manuscript report submitted to the Nova Scotia Department of Communities Culture, Tourism and Heritage, Halifax NS.

Maclead-Leslie, Heather. 2007. *Poor's Farm Cemetery and Dormitories: Bisset Road, Cole Harbour*, conducted under Heritage Research Permit A2007NS38. Manuscript report submitted to the Nova Scotia Department of Communities Culture, Tourism and Heritage, Halifax NS.

Nash, R.J. and V.P. Miller. 1987. Model Building and the Case of the Micmac Economy. *Man in the Northeast*, 34: 41-56.

Nova Scotia Department of Lands and Forests (NSDLF). 1946. *Crown Lands Grant Sheets #66*. Nova Scotia Department of Natural Resources (Revised). Halifax.

Nova Scotia Department of Natural Resources (NSDNR). 1787-1946. Crown Records Sheet #66: Crown Record Book 18 page 86, Crown Records Book 6 Page 510, Crown Records Displaced Plan No. 264, Crown Records Displaced Plan No. 305.

Nova Scotia Department of Natural Resources (NSDNR). 1945-1992. Aerial photographs; 1945 (8769-91), 1954 (14268-135), 1964 (18351-17), and 1974 (14122-171).

Powell, Steven. 1990a. *Archaeological Survey of Sandy Bay Provincial Park, Cole Harbour Day Use Park and Crystal Crescent Beach Provincial Park*. conducted under Heritage Research Permit A1990NS14. Manuscript report submitted to the Nova Scotia Department of Communities Culture, Tourism and Heritage, Halifax NS.

Powell, Steven. 1990b. *Wares Inn* site, Maritime Archaeological Resource Inventory form for the registry of BdCu-03.

Powell, Steven. 1990c. *Costley House* site, Maritime Archaeological Resource Inventory form for the registry of BdCu-04.

Powell, Steven. 1990d. *George Bissett House* site, Maritime Archaeological Resource Inventory form for the registry of BdCu-05.

Powell, Steven. 1990e. *Hezekiah Bissett House* site, Maritime Archaeological Resource Inventory form for the registry of BdCu-06.

Powell, Steven. 1990f. *Old Country House 'Poor's Farm'* site, Maritime Archaeological Resource Inventory form for the registry of BeCu-04.



**HRM SERVICED COMMUNITIES BACKGROUND STUDY: WESTPHAL (AKOMA LANDS)
ARCHAEOLOGICAL RESOURCE IMPACT ASSESSMENT, HALIFAX REGIONAL MUNICIPALITY, NS
(2023)**

Preston, Brian. 1987. Historic artifacts & settlement features, Maritime Archaeological Resource Inventory form for the registry of BeCu-01.

Preston, Brian. 1993a. *Governor's Farm* site, Maritime Archaeological Resource Inventory form for the registry of BeCu-08.

Preston, Brian. 1993b. *Morris Montague* site, Maritime Archaeological Resource Inventory form for the registry of BeCv-21.

Piers, Henry. 1895. Isolated Find, Pre-Contact (Late Archaic Period), Maritime Archaeological Resource Inventory form for the registry of BeCu-03.

Province of Nova Scotia (NS). 2019. *Journey of Light: A Different Way Forward, Final Report of the Restorative Inquiry – Nova Scotia Home for Colour Children*, submitted by the Commissioner, known as the Council of Parties, Halifax.

Public Archives of Nova Scotia (PANS). 1786. *Preston Letter A and B*, drawn by Theophilus Chamberlain, located in African Nova Scotians, Nova Scotia, Archives Map Collection F/230. Halifax, Nova Scotia: PANS.

Public Archives of Nova Scotia (PANS). 1967. *Place-names and Places of Nova Scotia*, Halifax: Nova Scotia: PANS.

Whitehead, R.H. 1991. The Protohistoric Period in the Maritime Provinces. In *Prehistoric Archaeology in the Maritime Provinces: Past and Present Research, Reports in Archaeology 8*. Edited by M. Deal and S. Blair, pp. 1-36. Fredericton: Council of Maritime Premiers Committee on Archaeological Cooperation.

Whitehead, R. 1993. Petroglyphs site, Maritime Archaeological Resource Inventory form for the registry of BeCv-17.

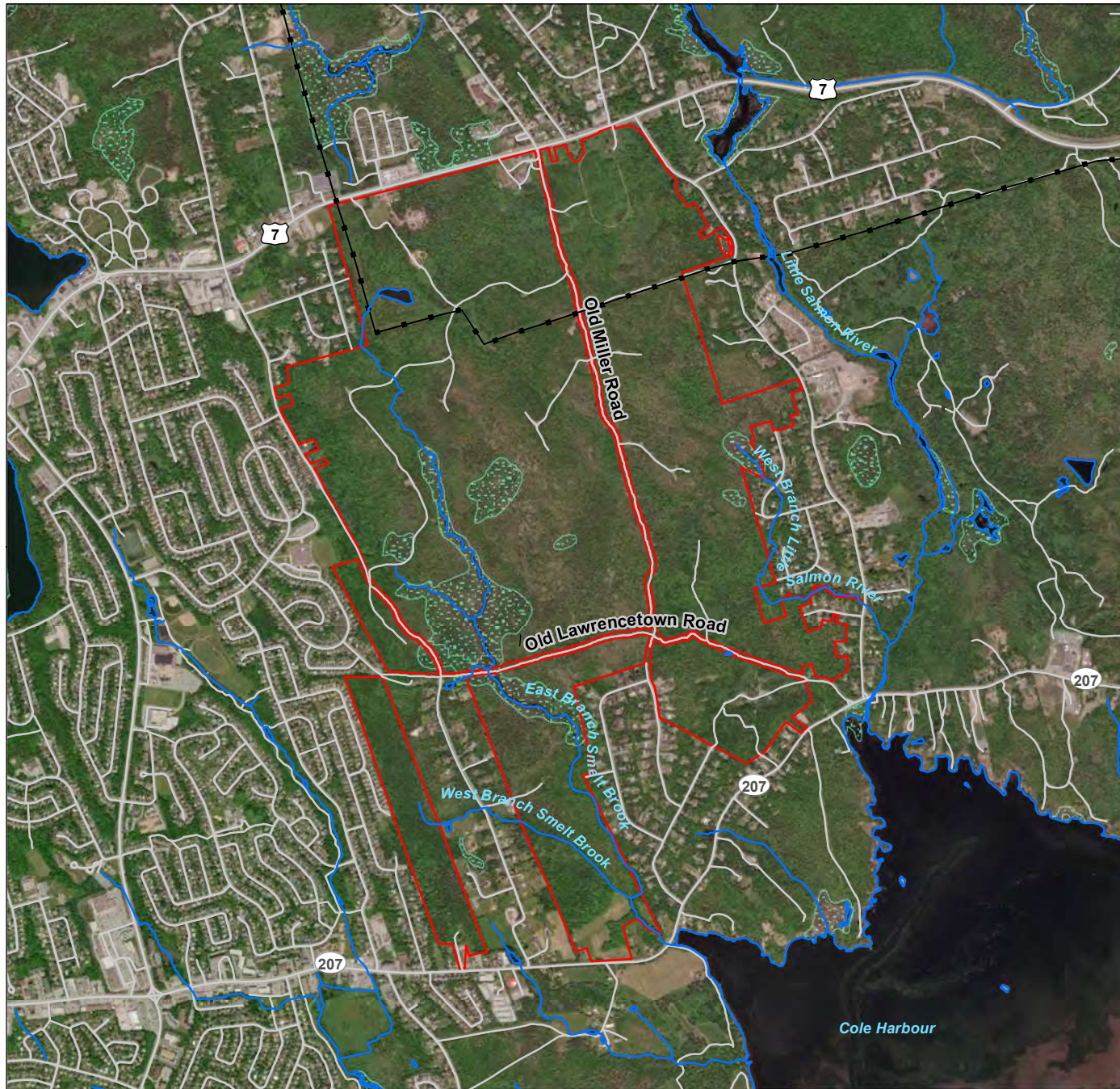
\\ca0213-ppfss01\work_group\1214\active\160410459\HRM_Archaeological_Assessments\Akoma_Lands_ARIA_2023\fnl_rpt_160410459_westphal_akoma_land_aria_20240409_NSCCTH_rev.docx



APPENDIX A

Figures

\\Ca0213-pplss01\work_group\1214\active\160410459\gis_data\working\mpra\Akoma_Lands\Figure1-160410459_Akoma_PDA_ARIA.mxd Revised: 2024-04-03 By: mrooney



Stantec

HALIFAX

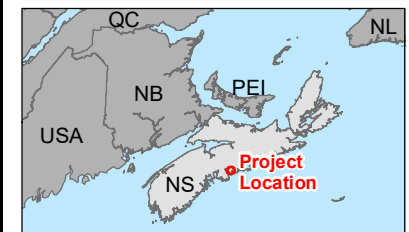
- Road / Highway
- Transmission Line
- Watercourse / Waterbody
- Wetland
- Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:25,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM and GNS
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Project Location Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia

Client/Project 160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

Figure No.

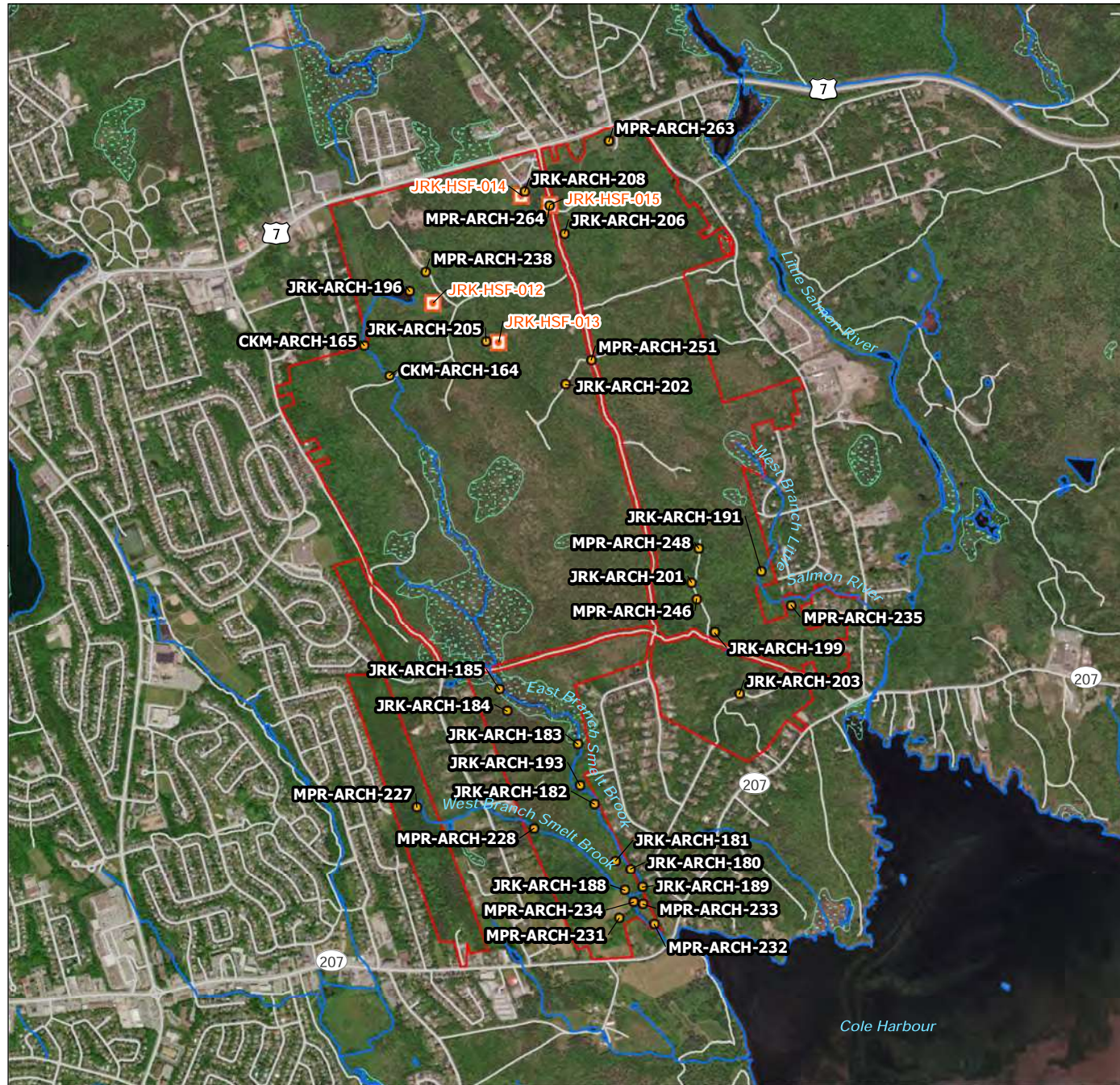
1

Title

Project Development Area

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

\\Ca0213-pplss01\work_group\1214\active\160410459\gis_data\working\mpr\Akoma_Lands\Figure2-160410459_Akoma_ARIA_Results.mxd Revised: 2024-04-03 By: mooney



Stantec

HALIFAX

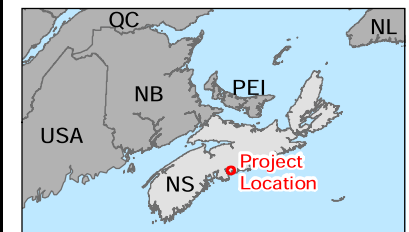
- Archaeological Assessment Note
- Heritage Feature
- Road / Highway
- Watercourse / Waterbody
- Wetland
- Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:25,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM and GNS
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Project Location Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia

Client/Project 160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

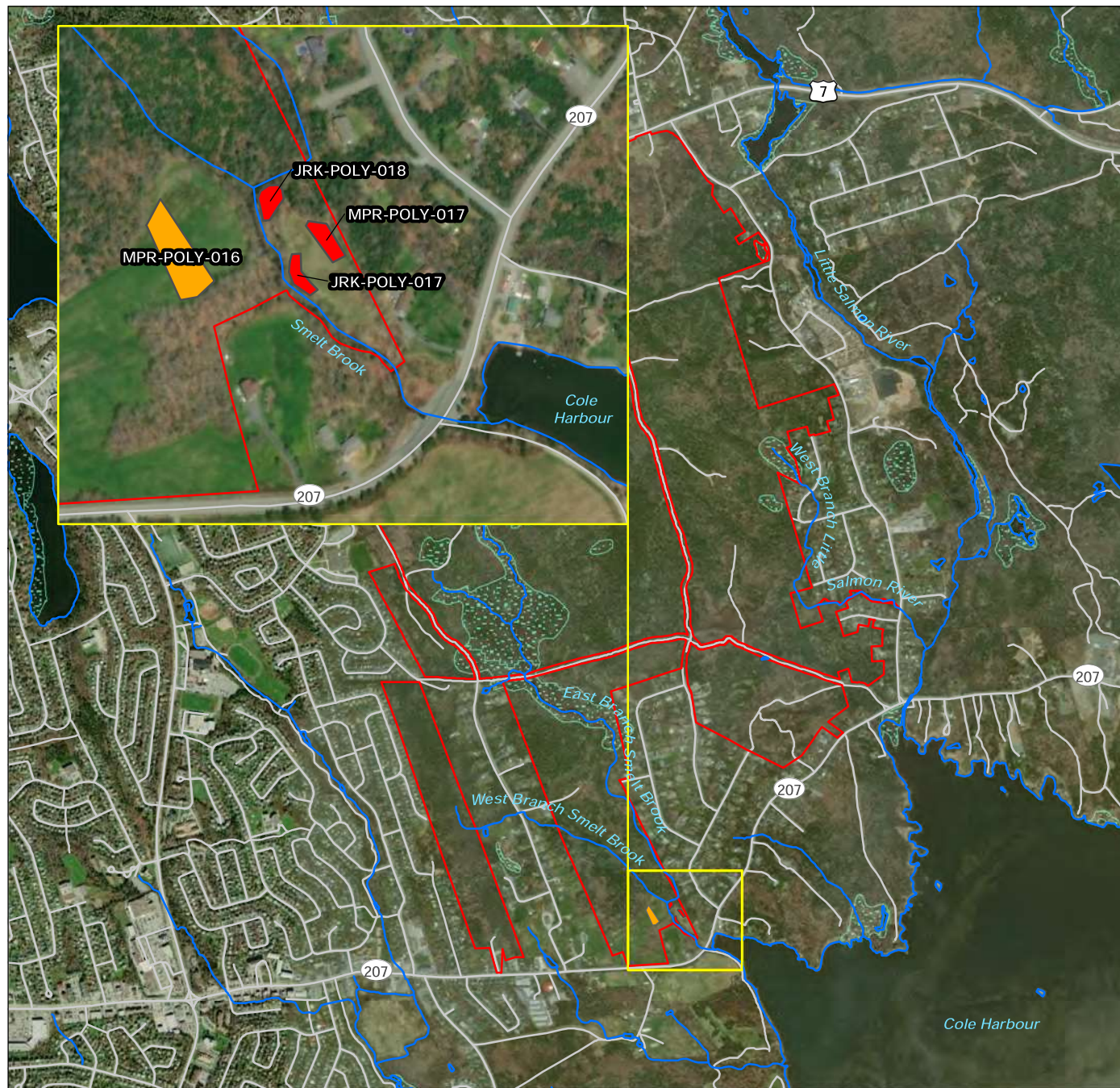
Figure No.
2

Title

Archaeological Assessment Notes
and Heritage Features

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

\\Ca0213-pplss01\work_group\1214\active\160410459_Akoma_Lands\Figures\160410459_Akoma_ARIA_HPAs.mxd Revised: 2024-03-03 By: mooney



Stantec

HALIFAX

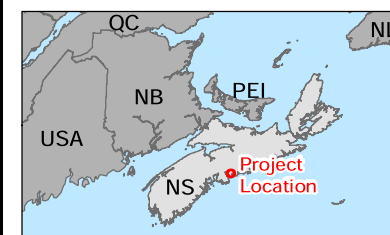
- High Archaeological Potential
- Medium Archaeological Potential
- Road / Highway
- Watercourse / Waterbody
- Wetland
- Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:25,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM, GNS, and GPS
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Project Location Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia
Client/Project 160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

Figure No.

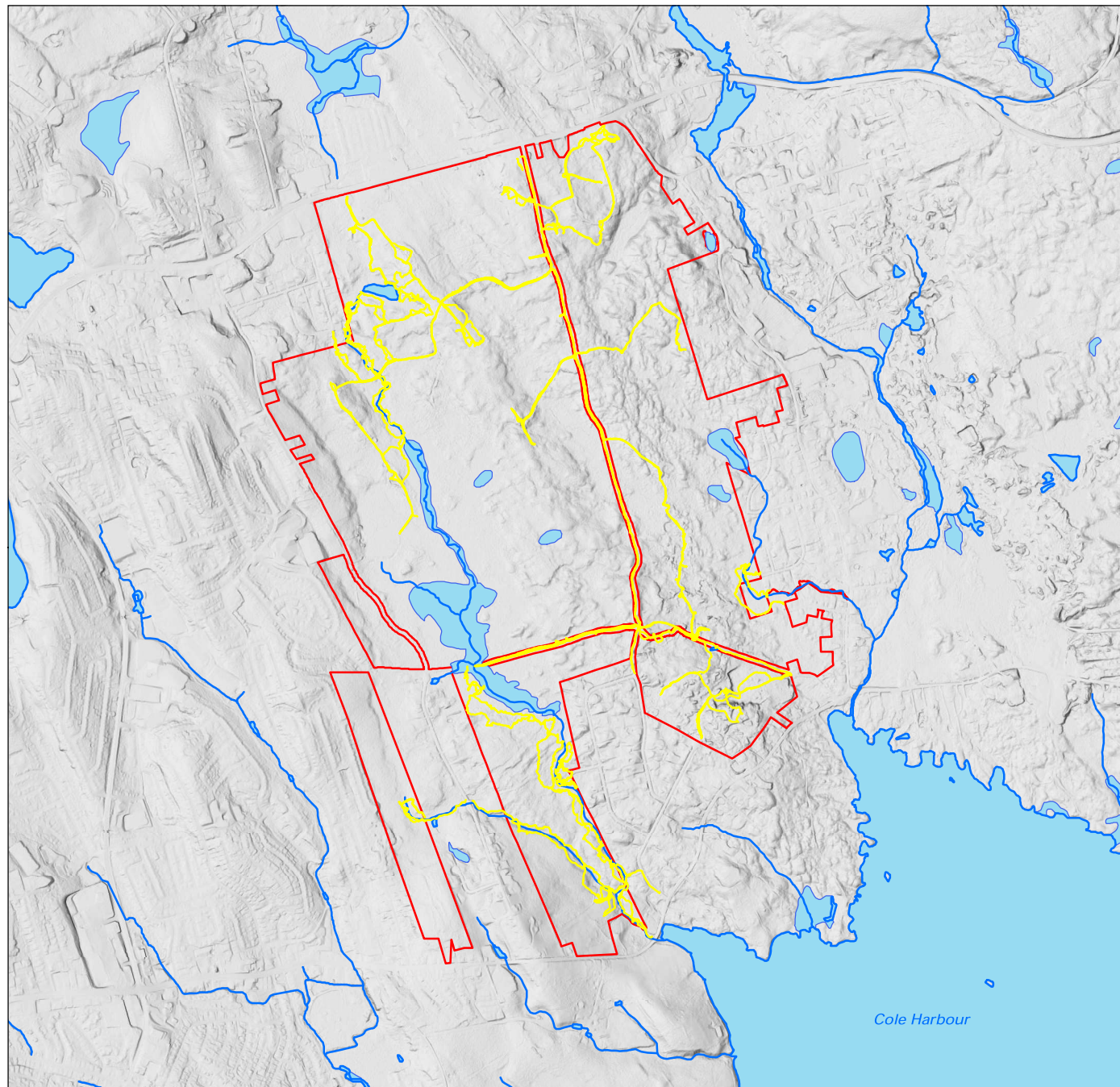
3

Title

Archaeological Potential Areas

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

\\Ca0213-pplss01\work_group\1214\active\160410459\gis_data\working\mpr\Akoma_Lands\Figure4-160410459_Akoma_ARIA_LIDAR.mxd Revised: 2024-03-03 By: mooney



Stantec

HALIFAX

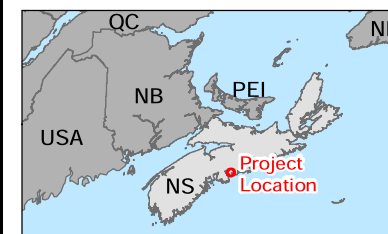
- Archaeological Survey Tracklog
- Watercourse
- Waterbody
- Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:25,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM, GNS, and GPS
3. Background: GeoNova 10K LIDAR Derived Topographic Hillshade



Project Location

Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia

Client/Project

160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

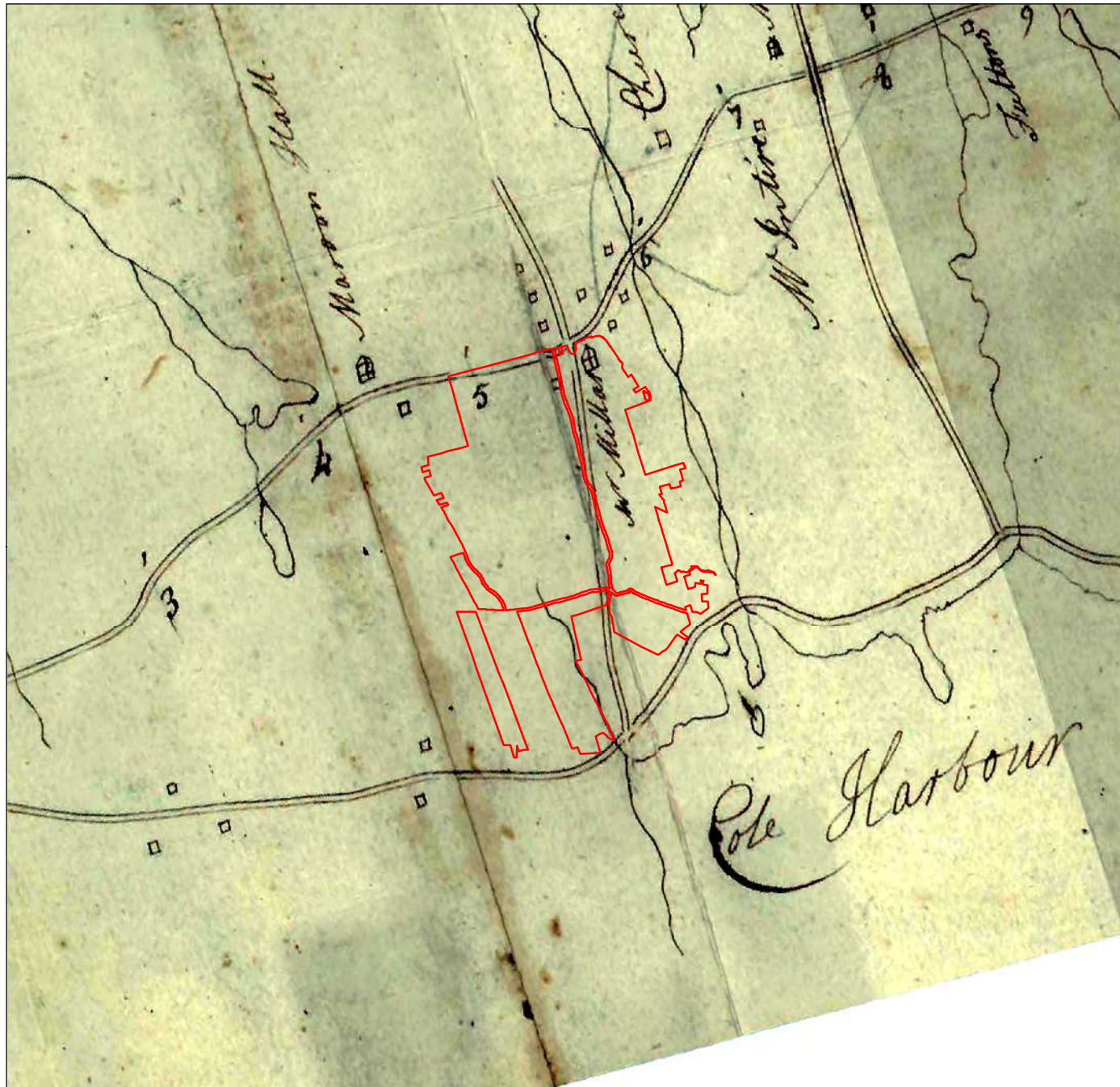
Figure No.

4

Title

Archaeological Survey Tracklog

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.



Stantec

HALIFAX



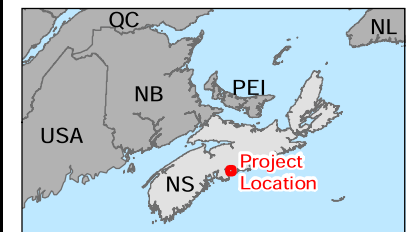
Project Development Area



0 0.5 1 Kilometers
(At original document size of 8.5x11)
1:50,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM
3. Background: Crown Records Displacement Plan No. 375 (dated 1800).



Project Location

Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia

Client/Project

160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

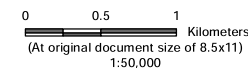
Figure No.
5

Title

1800 Crown Records Displaced
Plan

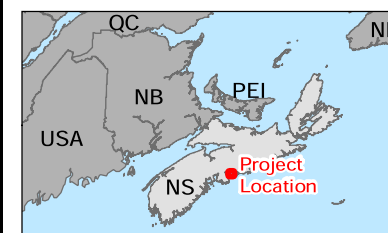


☐ Project Development Area



Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM
3. Background: Chamberlain Map of Halifax No. 264 (1813).



Client/Project	160410459-0001 REVA
----------------	---------------------

9

1813 Chamberlain Map

\\Ca0213-pplss01\work_group\1214\active\160410459\gis_data\working\mpr\Akoma_Lands\Figure-160410459_Akoma_ARIA_Church.mxd Revised: 2024-03-18 By: mrooney



Stantec

HALIFAX



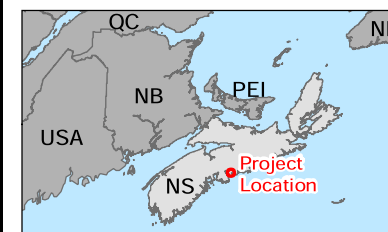
Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:30,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM
3. Background Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community and A.F. Church 1865 Map of Halifax County.



Project Location

Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia

Client/Project

160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

Figure No.

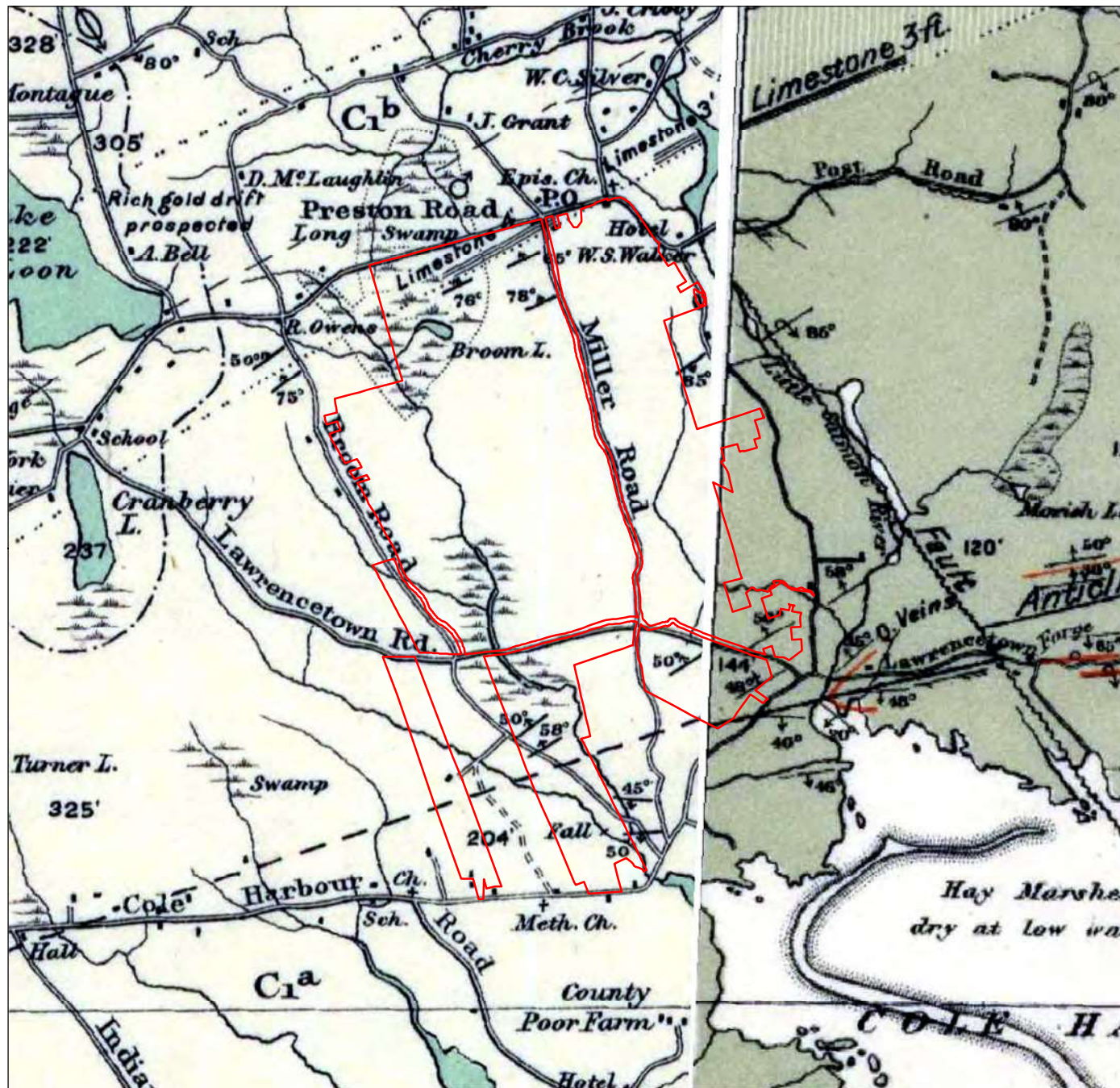
7

Title

1865 Church Map

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

\\Ca0213-plss01\work_group\1214\active\160410459\gis_data\working\mp\Akoma_Lands\Figure7-160410459_Akoma_ARIA_Faribault.mxd Revised: 2024-03-04 By: mrooney



HALIFAX

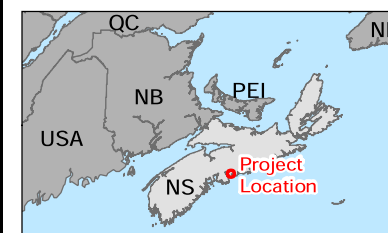
 Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:30,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM
3. Background: Department of Mines, Geological Survey Branch, City of Halifax Map Sheets 68 and 53 (E.R. Faribault 1908).



Project Location Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia
Client/Project 160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

Figure No.

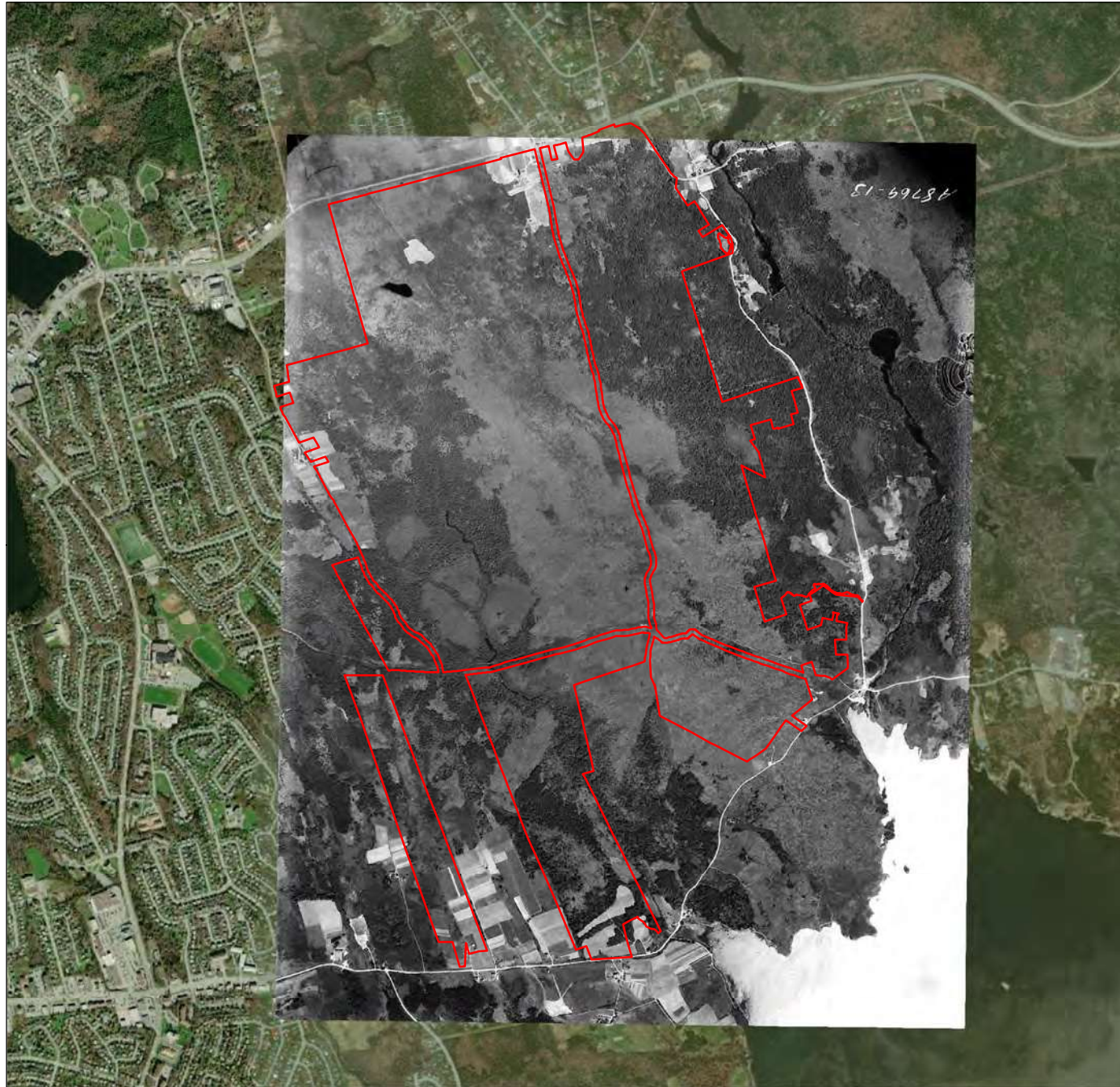
8

Title

1908 Faribaults Maps (Sheet Nos. 68 and 53)

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

\\Ca0213-pplss01\work_group\1214\active\160410459\gis_data\working\mpr\Akoma_Lands\Figure8-160410459_Akoma_ARIA_1945_Air_Photo.mxd Revised: 2024-03-04 By: mooney



Stantec

HALIFAX



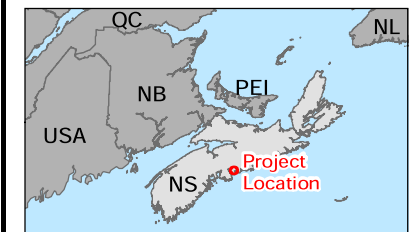
Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:25,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community and Natural Resource Canada's 1945 Historic Air Photo A8769-013.



Project Location

Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia

Client/Project

160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

Figure No.

9

Title

1945 Historic Air Photo

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

\\Ca0213-pplss01\work_group\1214\active\160410459\gis_data\working\mpr\Akoma_Lands\Figure8-160410459_Akoma_ARIA_1954_Air_Photo.mxd Revised: 2024-03-04 By: mooney



Stantec

HALIFAX



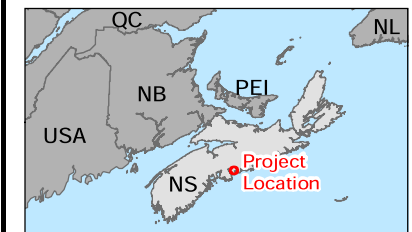
Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:25,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community and Natural Resource Canada's 1954 Historic Air Photo A14268-135.



Project Location

Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia

Client/Project

160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

Figure No.

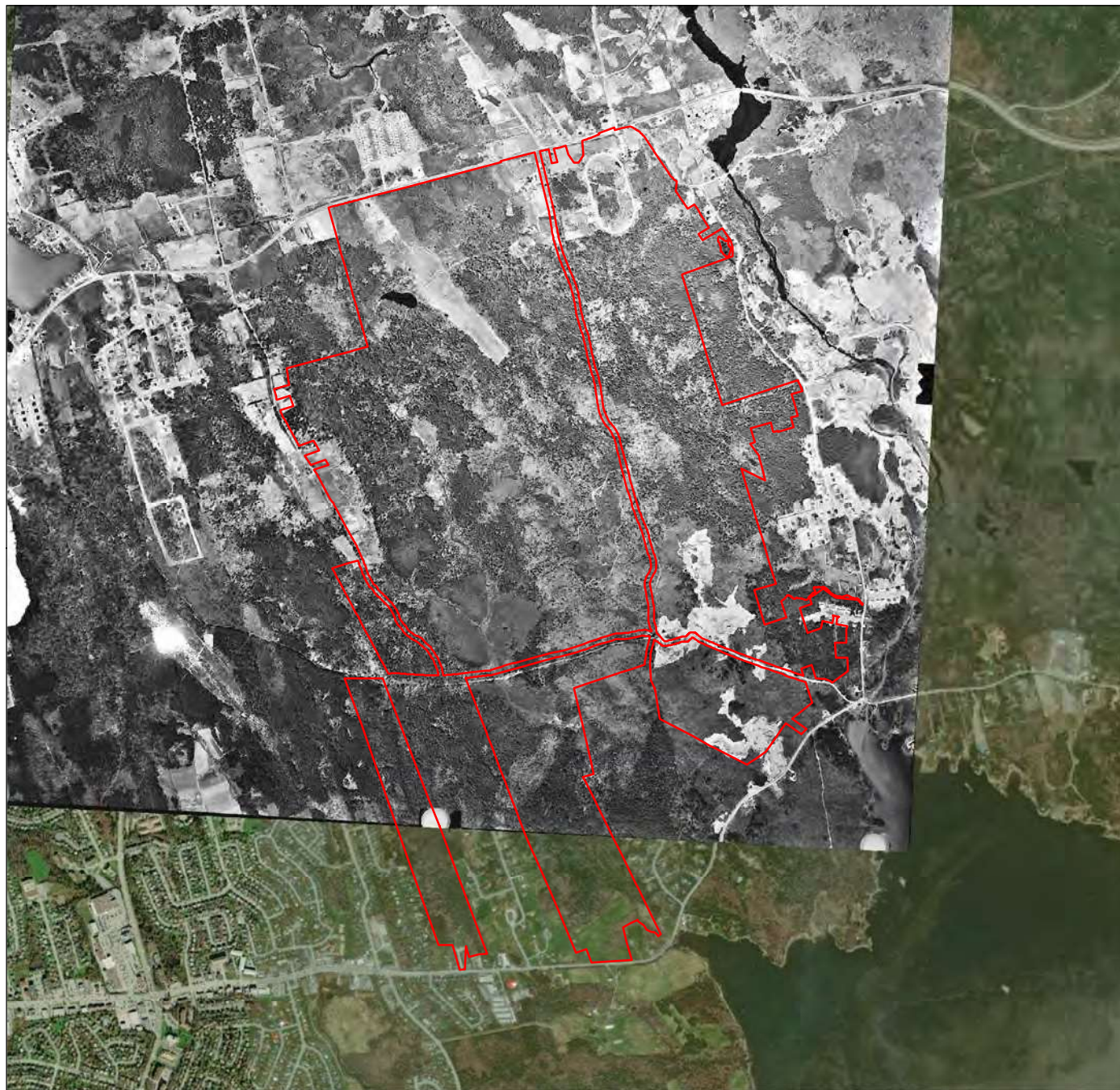
10

Title

1954 Historic Air Photo

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

\\Ca0213-pplss01\work_group\1214\active\160410459\gis_data\working\mpr\Akoma_Lands\Figure10-160410459_Akoma_ARIA_1964_Air_Photo.mxd Revised: 2024-03-04 By: mooney



Stantec

HALIFAX



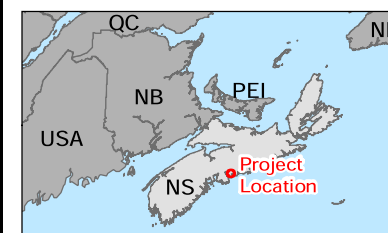
Project Development Area



0 250 500 Meters
(At original document size of 8.5x11)
1:25,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community and Natural Resource Canada's 1964 Historic Air Photo A18351-017.



Project Location

Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia

Client/Project

160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

Figure No.

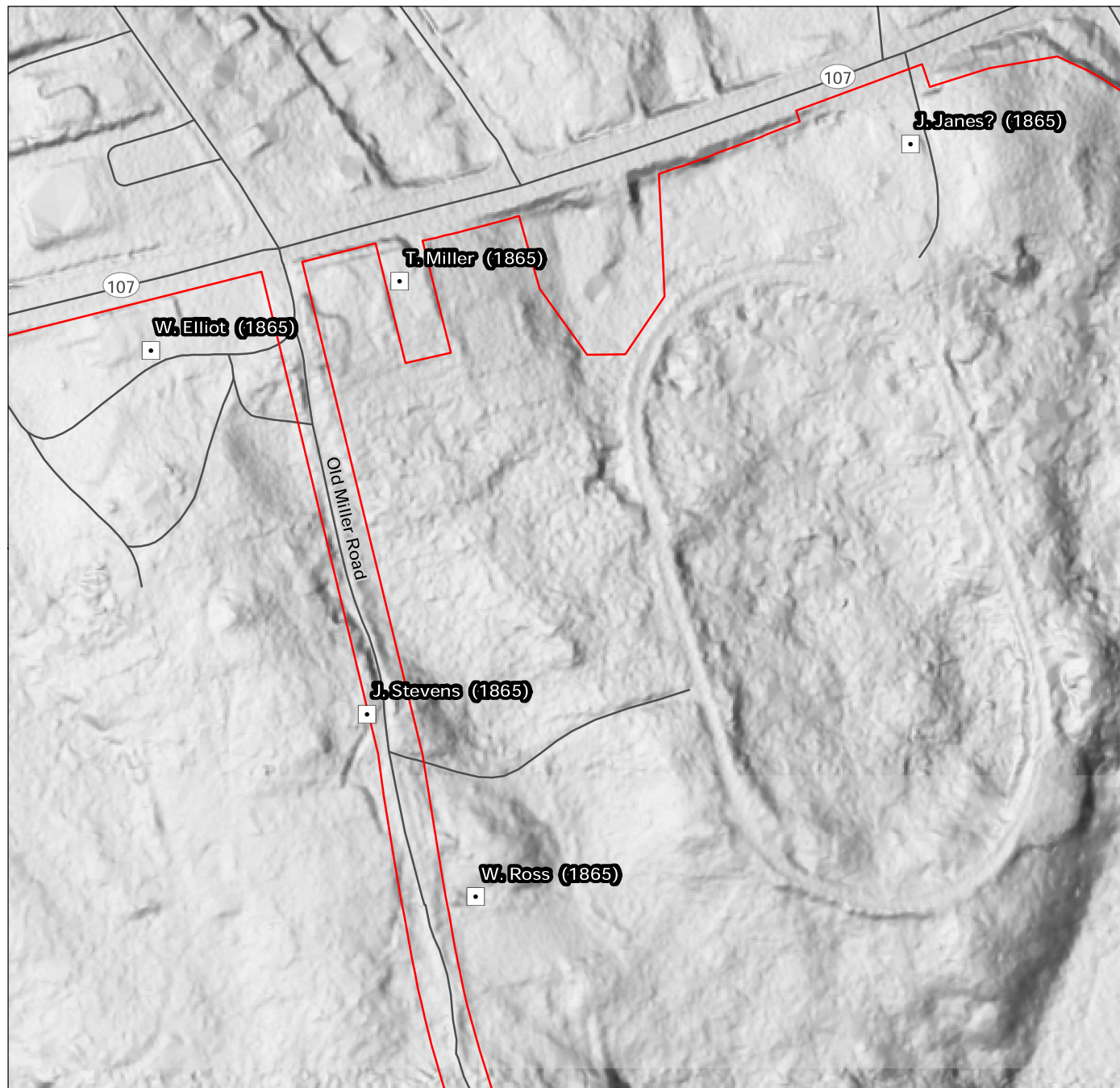
11

Title

1964 Historic Air Photo

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

\\Ca0213-pplss01\work_group\1214\active\160410459\gis_data\working\mpr\Akoma_Lands\Figure14-160410459_Akoma_ARIA_Dwellings.mxd Revised: 2024-03-18 By: mooney



Stantec

HALIFAX

- Dwelling / House
- Road / Highway
- Project Development Area



0 30 60 Meters
(At original document size of 8.5x11)
1:3,000

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources: HRM, GNS, and GPS
3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community and GeoNova 10K LiDAR Derived Topographic Hillshade



Project Location Prepared by MPR on 2024-03-01

Halifax,
Nova Scotia
Client/Project 160410459-0001 REVA

Halifax Regional Municipality
Future Serviced Communities: Akoma Lands ARIA

Figure No.
13

Title
Dwellings Depicted on 1865 Church
Map

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

APPENDIX B

Photographs

HRP A2023NS190



Photo 1 View facing south of the West Branch Smelt Brook at JRK-ARCH-180



Photo 2 View north showing an old trail encountered along the West Branch Smelt Brook at JRK-ARCH-181



Photo 3 View north showing the rocky surface conditions and past forest harvesting within the area at JRK-ARCH-182



Photo 4 View north of the East Branch Smelt Brook where the area becomes a wetland environment at JRK-ARCH-183

HRP A2023NS190



Photo 5 View northwest of a modern deer stand encountered at JRK-ARCH-184



Photo 6 View west from assessment note JRK-ARCH-185 where Smelt Brook opened into a larger wetland environment



Photo 7 View east from JRK-ARCH-185 towards the old Lawrencetown road at JRK-ARCH-185



Photo 8 View north showing the undulating and rocky surface conditions at JRK-ARCH-193

HRP A2023NS190



Photo 9 View south from the east side of the east branch of Smelt Brook at JRK-ARCH-193



Photo 10 View north from the end of Boom Lake at the beginning of the eastern branch of Smelt Brook at MPR-ARCH-240



Photo 11 View south and looking down the east branch of Smelt Brook at MPR-ARCH-240



Photo 12 View north from CKM-ARCH-164 showing conditions encountered along east branch of Smelt Brook in the northern section

HRP A2023NS190



Photo 13 View east of an old bridge footing encountered along the northern section of the east branch of Smelt Brook at CKM-ARCH-164



Photo 14 View south at MPR-ARCH-242 showing downed trees and forest debris



Photo 15 View west of a modern drainage feature installed to direct the flow of the northern end of the watercourse away from nearby houses at MPR-ARCH-227



Photo 16 View east at the northern end of the west branch of the Smelt Brook at MPR-ARCH-227

HRP A2023NS190



Photo 17 View north from assessment note MPR-ARCH-228 showing conditions encountered on West Brach Smelt Brook



Photo 18 View east from MPR-ARCH-228 showing the slope encountered on west side West Brach Smelt Brook



Photo 19 View north of the old trail that leads to the old fields to the south at JRK-ARCH-188



Photo 20 View south of the West Branch Smelt Brook and trail encountered at JRK-ARCH-188 at the end of an old field

HRP A2023NS190



Photo 21 View northwest at the identified medium potential area MPR-POLY-016 taken from MPR-ARCH-231



Photo 22 View west showing the identified medium potential area MPR-POLY-016 taken from MPR-ARCH-231



Photo 23 View southeast showing the identified medium potential area MPR-POLY-016 taken from MPR-ARCH-230



Photo 24 View northeast showing the treeline at the end of the field at the location of Smelt Brook taken from MPR-ARCH-230

HRP A2023NS190



Photo 25 View south of the waterfalls identified near the confluence of Smelt Brook east and west branches at JRK-ARCH-189



Photo 26 View north of the waterfall identified near the confluence at JRK-ARCH-189



Photo 27 View north showing the identified high potential area JRK-POLY-018 taken from MPR-ARCH-234



Photo 28 View northwest showing the identified high potential area JRK-POLY-018 taken from MPR-ARCH-234

HRP A2023NS190



Photo 29 View southwest of the identified high potential area at MPR-POLY-017 taken at MPR-ARCH-233



Photo 30 View west looking at the other elevated terrace on the west side at MPR-POLY-016 taken at MPR-ARCH-233



Photo 31 View south-southeast looking at the elevated terrace on the west side at MPR-POLY-016 taken at MPR-POLY-233



Photo 32 View northwest from MPR-ARCH-232 showing the location of the high potential area JRK-POLY-017

HRP A2023NS190



Photo 33 View north from MPR-POLY-232 showing the location of the high potential areas JRK-POLY-017 and MPR-POLY-016



Photo 34 View northeast at JRK-ARCH-191 showing a short section of the west branch of Little Samon River



Photo 35 View northeast at MPR-ARCH-235 showing that the watercourse is more of a forest drain



Photo 36 View southeast overlooking a section of the quarry located south of Old Lawrencetown Road at assessment note JRK-ARCH-203

HRP A2023NS190



Photo 37 View west overlooking the quarry section located to the south of Old Lawrencetown Road from assessment note MPR-ARCH-254



Photo 38 View north at the entrance for the section of the quarry located the north of Old Lawrencetown road at assessment note MPR-ARCH-244



Photo 39 View northwest from assessment note JRK-ARCH-199 overlooking the section of the quarry north of Old Lawrencetown Road



Photo 40 View east from assessment note JKR-ARCH-199 overlooking the section of the quarry to the north of the Old Lawrencetown Road

HRP A2023NS190



Photo 41 View west at a pile of large rip rap stones remaining within the quarry at assessment note MPR-ARCH-246



Photo 42 View of a section of the Old Lawrencetown Road, currently a public walking trail at JRK-ARCH-204



Photo 43 View north along the Old Miller Road in a quarry area at MPR-ARCH-251



Photo 44 View east from JRK-ARCH-202 down a woods road encountered in the middle of the PDA

HRP A2023NS190



Photo 45 View north from JRK-ARCH-205 from the south end of grassy field



Photo 46 View south from JRK-ARCH-205 at the end of the field



Photo 47 View north at a section of LSF at JRK-HSF-012 created from field clearing



Photo 48 View east of a LSF at JRK-HSF-013 created from field clearing activities and located within the treeline

HRP A2023NS190



Photo 49 View east of a LSF at JRK-HSF-013 created from field clearing activities



Photo 50 View south at MPR-ARCH-238 showing the north section of the field



Photo 51 View southwest at JRK-ARCH-196 overlooking Boom Lake in an area identified as a watering hole or landing for water access



Photo 52 View north of a trail and woods road from the old field which led to JRK-ARCH-196 located at the waters edge of Boom Lake

HRP A2023NS190



Photo 53 View north from JRK-ARCH-206 at an old field encountered on the west side of Old Miller Road



Photo 54 View south at the tree line having LSF at JRK-ARCH-206 which delineates the fields



Photo 55 View southwest at MPR-ARCH-263 of a vacant lot which until recently still had farm and commercial & residential buildings



Photo 56 View north at MPR-ARCH-264 at a twentieth century foundation feature at JRK-HSF-015

HRP A2023NS190



Photo 57 View northwest at MPR-ARCH-264 at a corner of a twentieth century foundation feature



Photo 58 View north at JRK-ARCH-208 showing some building present on the Akoma property



Photo 59 View west at JRK-ARCH-208 of the open field encountered on the Akoma property



Photo 60 View southwest from JRK-HSF-014 at concrete foundation features associate with the Akoma property

APPENDIX E

Old Growth Forest Types – Nova Scotia

Table C.1 Old-Growth Forest Community Comparisons from Other Jurisdictions

Nova Scotia FEC Forest Group	Nova Scotia FEC Vegetation Types	Nova Scotia Old Growth Age-of-Onset (years)	ON ^a General Species Association	ON ^a Old Growth Age-of-Onset (years)	Minnesota ^b Old-Growth Forest Types	Minnesota ^b Old Growth Age-of-Onset (years)
Tolerant Hardwood	TH1, TH2, TH3, TH4, TH5, TH6, TH7, TH8	140	Hard Maple Yellow Birch Red Oak	120-140 150-160 110-120	Northern Hardwood Forests	120
Spruce-Hemlock	SH3, SH4, SH5, SH6, SH7	125	White Spruce	110-130	White Spruce Forests	90
Spruce-Hemlock	SH1, SH2	140	Hemlock	140-180	n/a	
Mixedwood	MW1, MW2, MW3	125	Yellow Birch Soft Maple Hemlock	150-160 80-120 140-180	Oak Forests	120
Spruce-Pine	SP4, SP5, SP7, SP9	125	White Pine Black Spruce	130-150 90-150	Red and White Pine Forests ^c	
Cedar	CE1	100	White Cedar	100-150	Upland White Cedar Forests	120
Wet Coniferous	WC1, WC2, WC5, WC8	100	Black Spruce	90-150	n/a	
Coastal	CO1, CO4	100	Black Spruce Balsam Fir	90-150 70-80	n/a	
Coastal	CO3, CO5, CO6	125	White Birch Soft Maple	90-110 80-120	n/a	
Highland	HL1, HL2	100	n/a		n/a	
Highland	HL3, HL4	140	Yellow Birch	150-160	n/a	
Wet Deciduous	WD3, WD4, WD6, WD8	115	Soft Maple	80-120	Lowland Hardwood Forests	120
Floodplain	FP1, FP2, FP3	125	Hard Maple Soft Maple Red Oak	120-140 80-120 110-120	Lowland Hardwood Forests	120
Karst	KA1, KA2	125	Hemlock	140-180	n/a	

a – Uhlig et al. (2001)

b – Minnesota DNR (2021)

c – Minnesota DNR (1989)

Table C.2 Maximum longevity for dominant tree species associated with the forest groups (and vegetation types) included in Nova Scotia's old-growth forest definition

Tree Species	Literature Max age ^{ab}	Literature Max age – 50%	L&F database Max age ^{cde}
Eastern Hemlock	800	400	520
Red Spruce	400	200	335
White Pine	450	225	288
Black Spruce	250	125	277
Black Spruce Coastal	250	125	150
Balsam Fir	200	100	160
Sugar Maple	400	200	276
Yellow Birch	366	183	370
Red Oak	400	200	205
Red Maple	300	150	188

a – Burns and Honkala (1990).

b – Loehle (1987).

c – Natural Resources and Renewables Permanent Sample Plot Database

d – Natural Resources and Renewables Forest Ecosystem Classification Plot Database

e – Natural Resources and Renewables Old-Forest Research Plot Database